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VOL. I.—14TH YEAR.

SYDNEY: SATURDAY, MAY 28, 1927.

No. 22.

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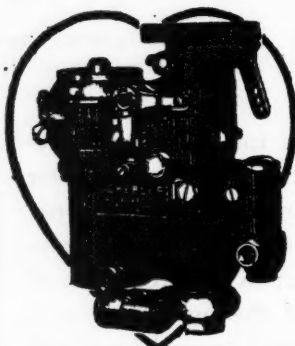
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THE EPILEPSIES OF CHILDHOOD.¹

By A. W. CAMPBELL, M.D. (Edin.),

Honorary Neurologist, Royal Alexandra Hospital
for Children, Sydney.

OF nervous diseases in childhood, whether encountered in private or hospital practice, epilepsy in some form is perhaps the most frequent and although our inclination may be to pass by such conditions as uninteresting or intractable, their frequency alone justifies their discussion. But since we speak nowadays not of one epilepsy but of many epilepsies and since the already broad basis of epilepsy has been still further extended by the recent inclusion of striatal or extrapyramidal and of psychogenic forms, it becomes compulsory that discussion shall be narrowed by selection. Accordingly I am selecting for consideration (i) convulsions in infancy, which by the way I assume to be a form of real epilepsy, and (ii) forms of epilepsy in childhood, both mainly in relation to prognosis.

Convulsions in Infancy.

Regarding convulsions arising in infancy it is obviously desirable to be able to speak concerning the prognosis. I submit that the key is provided by a consideration of variety and cause. Beginning with that variety of convulsions arising during the first day of life we have as causes, first, delayed birth on the one hand with its attendant supervenosity and precipitant birth on the other hand with its unduly sudden alteration of vital circumstances and, secondly, gross injury to the brain, however induced, and perhaps indicated by phenomena of paralysis. Obviously the prognosis in the case of the latter is as grave as in the former it is favourable. If again an infant suffers from convulsions on the first day of life and continues to have recurrences until such time as it becomes manifest that dawning intelligence is clouded by some developmental "blot upon the brain," confirmed epilepsy is almost an eventual certainty.

Next, in older infants we have a group of cases of convulsion which we ascribe to toxæmia of some kind. Such convulsions may arise in children previously healthy and the toxic agent may be associated with acute alimentary disorder, and one common form of alimentary disorder is that resulting from faulty feeding, in which respect bottle babies are often sufferers. Again such convulsions may be associated with some pyrexial illness, such as pneumonia or one of the milder exanthemata. Also pertaining to this group we have the conditions which are described as of reflex origin. Whether it is correct to call them of reflex origin is a moot point, but the irritation of teething may be given as an exemplary cause. Now it is for consideration what bearing such convulsions have on the future health of the child, in particular does the occurrence of

such convulsions in itself denote a disposition to epilepsy. The question is not so easy to answer as it may appear, because to few is the opportunity given of following up a series of patients. I personally have a relatively small number to go upon, but my opinion, given for what it is worth, is that the prognosis in cases as defined is good. I believe in the old saying that "a condition, which in an adult would cause a rigor, in a child may cause a convulsion." At the same time there are reservations. I am also a most firm believer in the baneful influence of an hereditary tendency to epilepsy and therefore reserve prognosis until assured concerning the family history. Also among convulsions arising with exanthemata I regard those with whooping cough as serious; such convulsions may be due to more than supervenosity, namely to venous rupture or thrombosis provoking a lesion which may remain as an epileptogenic focus. Also convulsions with scarlet fever are to be regarded seriously.

As to convulsions of meningitis, encephalitis and other neurophilic infections and uræmia, I need not do more than mention them because they are but symptoms of the more serious disease.

Next we have an important group of cases in which convulsions arise and repeat themselves without obvious cause in apparently healthy children, but children in whom there is a history of inherited tendency to epilepsy. In such cases the prognosis is undoubtedly bad. Lastly to complete this list we have the group of so-called spasmophilic conditions, illustrated by the carpopedal spasms of tetany and by *laryngismus stridulus* whose doubtful relation with epilepsy is for your consideration. Spasmodic affections in association with rickets come in this category, but fortunately for us though rickets does occur in children in Australia, it is relatively uncommon in comparison with what obtains in England.

Postinfantile Epilepsy.

We may now pass to epilepsy in children over the period of infancy and here interest centres upon minor epilepsy or *petit mal* or the incomplete attack. Although to the physician the major seizure is the more dramatic, the minor turn is the outstanding criterion of epilepsy and among children is to be observed with great frequency. I need not dwell upon the forms of minor epilepsy, it may suffice to say that they are numerous and that the commonest is recognizable as a sensation, turn or lapse in which a momentary loss of colour, fixation of the eyes and dilatation of the pupil may alone accompany the transient loss of consciousness. In addition to these one often sees the equivalents of minor epilepsy in the shape of substitution phenomena which may be psychical or motor. The psychical phenomena are illustrated by a brief period of mutism or by a transient hallucinatory or delusional state; while simple automatic actions, such as aimlessly rising from a seat or attacks of paroxysmal laughter or sneezing illustrate the physical phenomena.

¹ Opening a discussion at a meeting of the New South Wales Branch of the British Medical Association on April 28, 1927.

The prognosis in all cases of minor epilepsy I personally regard as serious. I think the "turns" may be taken as signs of essential epilepsy; I generally find that they do not yield to treatment and I always fear that sooner or later major attacks will appear and that the final outcome will be confirmed epilepsy. Moreover from the ætiological aspect I believe this to be the class above all others in which inquiry will disclose hereditary taint.

Pyknolepsy.

Bearing on minor epilepsy it may now be asked whether any members have observed patients suffering from the condition called pyknolepsy, recently described as one arising in children between four and ten years of age and characterized by attacks resembling ordinary *petit mal*, but following one another in quick succession or in a heap, hence the term pyknolepsy, the Greek word *πυκνός* meaning a heap. The condition gives a silver lining to the cloud of epilepsy, because, it is said, that though patients cannot be bettered by the usual epileptic remedies, the prognosis as to the eventual disappearance of the condition is most favourable. Perhaps many of us have seen patients with pyknolepsy, not recognized as such because we have not been able to follow them up. The lesson is to look out among children for minor epilepsy occurring in "heaps."

Major Epilepsy.

Passing now from minor to major epilepsy, my remarks will be brief, because the form which the major seizure takes in children differs in no fundamental way from that in the adult. I will only mention as an opinion that in the child a typical major attack is less exhausting than in the adult; also that *status epilepticus* in the child is less exhausting and less frequently fatal than in the adult. I have notes of many cases in which children have passed from fit to fit through many hours and though the fits have been complete, in the intervals there has been a brief return to consciousness, perhaps a word or two spoken and notwithstanding that the total count has been great, cessation of the attacks has been followed by quick general recovery.

Another point bearing on major epilepsy in children is that such attacks are not infrequently followed by brief outbursts of mental derangement, characterized by wild conduct, fleeting hallucinations and illusions, disorientation and mental confusion, outbursts not very different from those occurring in adults.

A word also may be said concerning remissions and this applies to both major and minor attacks and consists mainly of a warning. Now remissions may take place at any age period between one and twelve years and may do so without any explanation, merely illustrating the extraordinary uncertainty of the disease. The warning is to remember that with the onset of puberty there is great liability to recurrence.

Having mentioned puberty I may add that I think what Hippocrates wrote remains undisputed: "Epilepsy which begins about puberty is susceptible

to cure." Also that with the onset of puberty we begin to see hystero-epilepsy.

Lastly the psychology of the epileptic child is for your consideration. We know that in the adult there is a recognizable epileptic temperament. The question is whether the same obtains in childhood—whether Pierce Clark, of New York, is right in maintaining that the make-up of the frank epileptic can be easily detected in early childhood, years before the disorder is established.

Conclusions.

There remain for consideration matters upon which I personally have few offerings to bring. The first is the matter of disorder of metabolism in connexion with the epilepsies of childhood. I regret being unlearned in biochemistry, but fully recognize the importance of the subject and have in mind the research published by local members of our profession, namely Drs. Prior and Evan Jones on the calcium index and the alkalinity of the blood in epilepsy.

Another matter is the relation between endocrine glands and epilepsy. Upon this I have an open mind, but I notice that Aldren Turner, perhaps the highest British authority on epilepsy, remarked recently that the degree of importance attached hereto is unjustifiable. And as to the thyroid gland in particular there is astonishing divergence of opinion, some advocating the administration of thyroid extract by the mouth, others not only declaring that this is useless, but actually advocating excision of the gland. As to the oral administration of thyroid I am sure there are many of us who have given this a trial, but if it be a fact, as some biochemists say, that the basal metabolism of the epileptic child is either normal or elevated, then thyroid gland medication is contraindicated; while as to the drastic measures of thyroidectomy, I believe it to be a fact of physiology that a thyroidectomized animal can be sent into convulsions by an epileptogenic drug, such as absinth, just as readily as one which is whole.

EPILEPSY IN CHILDHOOD.¹

By GUY P. U. PRIOR, L.R.C.P. (Lond.), M.R.C.S. (Eng.),
Medical Superintendent, Parramatta Mental
Hospital, New South Wales.

I THANK you for the honour you have done me in asking me for a paper upon epilepsy in childhood, but fear that I may disappoint you.

I propose not to make any remarks upon the meaning of the word epilepsy. We know more or less what we mean by epilepsy and in this general sense (which we all understand more or less) I will use the term.

My experience with children is much less than with adults, so to meet the requirements of this meeting I have extracted notes from two hundred

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on April 28, 1927.

Owing to lack of space the bibliography of this paper has been held over until next week's issue.

of my patients who have come to me as epileptics and whose epilepsy commenced either in childhood or in early adult life, and from these two hundred cases I will endeavour to draw some lessons. The case histories are very deficient and any numbers or any items could be multiplied with more complete histories.

I will occupy a few minutes with general remarks as to possible causative agencies that these cases may have in common and then point out some unusual or interesting features that some of them present.

Causative Agencies.

Family Inheritance.

As to the family inheritance, sixty-six of these patients are known to have had near relatives insane or epileptic and in thirty-four instances there was more than one member of the family epileptic.

In one family of nine whose mother had for a time been epileptic, seven children took fits, five of the nine who had married had eleven children, among whom were two epileptics. In all these, with the exception of the patient who came under my care, the epilepsy ceased between the ages of nine and thirteen years. My patient suffered from the attacks between the age of ten months and thirty-one years, but has now been free for several years. I will make some further remarks about this patient later. In five cases one or other parent had committed suicide. It is admitted in twenty-seven cases that the father or mother took alcohol to excess and in four instances one or both parents admit syphilis. The five and a half year epileptic child of one of these gave no reaction to the Wassermann test in three examinations, another older child of a tabetic father also failed to react. Seventy-nine of the patients with histories incomplete, have an inheritance of insanity, epilepsy, alcoholism or syphilis.

Prenatal Influence.

The influence of consanguinity in the series is not great; in two cases the parents were first cousins. Eight children were premature (one stated to be seven months and weighing 2.5 kilograms or five and a half pounds when born), five were seven months children and two eight months.

Five of the patients were twins, in one case the other twin had died shortly after birth, in three cases they were healthy and in one case the other twin was also epileptic. In these twins the attacks commenced at puberty, each having the first menstrual period and the first attack within a few days of each other.

In eight cases there is a history of illness, trouble or anxiety on the part of the mother while pregnant. One suffered from pneumonic influenza. The husband of another died when the wife was two months pregnant. One was travelling in the war zone. One was kicked by a cow two months before the birth of the patient. Two had much domestic worry caused by husband's conduct and one had a uterine operation. In one case the husband had left for the war when the mother was three months

pregnant and about this time she was much frightened by seeing a child in a fit.

Birth and Labour.

In sixty-eight cases the nature of the birth and labour has been noted. In thirty-nine of these it was said to have been natural, in five prolonged but no forceps were used, twenty-two were cases of instrumental delivery and one was a breech presentation. One, a transverse presentation, was the first pregnancy after seventeen years of marriage. In one case the first convulsion occurred the day after instrumental delivery, in another the head was cut and bruised. In a third there was a depressed fracture behind the right ear, in another the head was stated to have been injured by forceps and one full-time child weighed only 2.5 kilograms (five and a half pounds).

It has been stated that the first born of a family is the most liable to epilepsy because of birth difficulties. In one hundred and nine cases the position in the family has been noted; twenty-seven are the eldest, twenty-two the youngest and fifty-five hold intermediate positions. Of the first of the family ten were born after prolonged labour and the use of forceps, the other seventeen were said to have been born after normal labours. Of the youngest eight only are the youngest in a family of eight or over. Ninety-seven of the patients started life with one or more than one of the handicaps just mentioned, namely a bad parentage, a difficult or wrongly timed entrance into the world or being a first child or the youngest of a large family.

Infantile Convulsions.

Fifty of the patients suffered from infantile convulsions and in fifteen cases the epilepsy dated from these early convulsions. Several, after continuing to have convulsions for some years, have had long remissions with a return in later life.

Causation.

Many and varied are the causes given by the patients' friends, some of these, more especially those relating to injuries of the head, are remote in point of time from the first attack and probably have nothing to do with the subsequent illness. In others, the first convulsion follows immediately or very near the stated cause and in these the true cause is probably given. In ninety cases some exciting cause is suspected.

Accidents.

Accidents in the form of injuries to the head (from falls from perambulators to train accidents or those occasioned by motor cars) are given in twenty-eight cases. In seven of these the first convulsion was not until from six months to several years after the accident which may have played no part in the causation. In seventeen cases the first convulsions and the accident were so closely related that it is fair to consider them as cause and effect. Three were cases of fracture of the skull and two of concussion of the brain. In one case of concussion the fit followed one month later and in the other six months later. In nine cases there

were lesser injuries, falls or kicks upon the head without unconsciousness, but the convulsions occurred within a few hours of the injury. One was not a head injury but the patient had been nearly drowned.

Fright and Emotional Causes.

In twenty-four cases fright or a deep emotion is given as a cause. In all these it is thought that the given cause can be accepted. In many of these the result was immediate and the longest period between the cause and effect was three weeks.

In six cases the child found or saw someone dead. Three, all in their early teens, unexpectedly found their father dead. In one of these cases a boy had a fit on the same day after discovering his father hanging after suicide. He had previously had fits, but had been without for six years. In the other two cases there was an interval of two and three weeks after the fright respectively. Another, aged twelve years, saw a man shot and one, aged ten years, saw a woman drowned while swimming in the same baths. In four cases the children were frightened deliberately, one by having crackers let off near her, two by other children wearing masks, another, aged four years, by tales, so commonly and so stupidly told, of being taken away by a strange man if not good. A boy, aged fifteen years, was chased by a drunken woman and fell in his first fit on reaching his home. A boy, aged three and a half years, had a series of forty fits after being caned and a girl, aged thirteen, fell in a fit as she was about to be caned. Two were frightened by dogs and two by bovines. All four were girls, their ages varying from four years to fourteen years. In the youngest of these any fright afterwards would produce a fit. She eventually died in *status epilepticus* at the age of nineteen years.

In some of the cases which were attributed to accident or injury, the harm done seems to have been of the slightest importance and the convulsion shortly after the supposed cause may have been due rather to fright than to the actual injury.

Acute illnesses and the specific fevers were given as responsible for twenty-seven cases; among these meningitis was said to have been the cause in four instances, diphtheria in two, diphtheritic antitoxin in one, vaccination in two and encephalitis in one. Another established epileptic became much worse after vaccination. In all these cases the first epileptic fit was during or within a few months of the acute illness.

Dentition.

Dentition figures as the cause in only four cases. In one of these the child, aged two years, had her first attack while cutting her teeth and at the same time she was suffering from whooping cough. These continued until she was five years old, there was then an intermission until she was sixteen years old; at this time the attacks returned when she was cutting a wisdom tooth.

Digestion.

In seven cases digestive trouble was the exciting agent. One child of eight years had his first attack

after a meal of prickly pear, his fits afterwards were always associated with diet. Another had his first attack after eating sugar-cane and unripe grapes and the fits in a third followed a feed of unripe grapes.

Worms.

In Case 161 the attacks were apparently caused by intestinal worms.

This patient was a girl, aged six years, who had for six months previous to admission been taking several fits every night. It was found that she was badly infested with *Oxyuris vermicularis*; after getting rid of this infection she had no more attacks.

The association of intestinal worms and fits in puppies is quite common and in them I have known fits continuing for weeks to cease immediately after the effective action of a vermifuge.

Metabolic Causes.

Two cases might be said to be of metabolic origin.

One patient, a lad of fifteen, grew fifteen centimetres (six inches) in one year, another of sixteen grew thirty centimetres (twelve inches) in two years. In each case the first fit followed this increased growth.

Operations.

In five cases the attacks came after some operation.

In one case the attacks commenced three months after operation for removal of the appendix.

A girl of fourteen who had convulsions at two years of age, became an epileptic after having chloroform because of injury to leg.

Another who had had six fits when twelve years of age, had a return at fifteen following operation for adenoids.

A boy of sixteen years who had for twelve months had an attack or two a month, after an operation for circumcision had a great increase in the number of fits and became maniacal and delusional. He rapidly improved and had no attack for two years, until he had some teeth extracted under chloroform; five days after this he had an epileptic attack.

We suggest that operations and anaesthetics may bring about the convulsive attack in the same way as fright or emotion.

Injuries to head, fright or emotion, acute illnesses and digestive troubles, are the most common of the precipitating causes. Head injuries or many of them, may stand by themselves, but can any common reaction be brought about by fright, illness, anaesthesia, operations *et cetera*?

Cannon has shown that the secretion of adrenalin is greatly increased in emotional states and in pain.

Crile states that:

Fear will increase the metabolic rate from 10% to 20% and that it will cause profound changes in the cells of the brain, liver and adrenals and in some cases the blood is acidosed, the adrenalin output is increased. Intravenous injections of protein will produce the same histological changes in the brain, liver and adrenals as fear and other types of exhaustion.

Foreign protein will increase the output of adrenalin. Fever, pain, injury, ether and chloroform will according to Crile bring about the same changes as fright and foreign proteins, in fact any-

thing causing shock and exhaustion will cause changes in the brain, liver and adrenals.

The brain is profoundly, even vitally, dependent upon the adrenals and without them the brain loses its functional power and power of survival.

The adrenals exert a vital influence on the liver, excessive amounts of adrenalin producing chromatolysis, oedema, displacement of nuclei and loss of the power of differential staining. Similar changes in the liver cells follow double adrenalectomy. When the liver cells are thus altered the brain is unable to work normally and becomes exhausted. The brain is dependent upon the functional integrity of the liver, the liver in part upon the adrenals, each upon oxidation which in part is dependent upon the adrenals.

He concludes that the liver and the brain are dependent upon each other and upon the adrenals. Emotion, fright, injury and anaesthetics, may cause an excessive adrenalin output, followed by liver derangement.

Digestive disorders can be followed by the absorption of foreign protein and it is said that intestinal worms will give rise to proteins and these proteins will cause an increased secretion of adrenalin.

I would suggest that the above causes act by the same means, namely by a liver dysfunction following the adrenal stimulation, this liver dysfunction allowing the formation of convulsive stimulating substance, probably a protein product. It is known that several of the amino-acids are convulsants and it is possibly one of these.

Syphilis.

In four cases one or other parent admitted syphilitic infection. The epileptic child of two of these gave a positive response to the Wassermann test. One failed to react on several examinations and in the fourth case the blood was not examined. In ten other patients a Wassermann reaction was obtained. In the child of a tabetic father the blood failed to react. Two other patients although failing to react to the Wassermann test, are included under this heading, as they made such great improvement under antisyphilitic treatment. These were women, both very resistive to bromides and both had extensive serpigenous ulceration of the legs which became worse if any attempt were made to push bromides. These ulcers healed with the typical syphilitic scarring.

If we include these two and those whose parents had syphilis but who failed to react to the Wassermann test, fifteen patients were tainted with this disease. One whose epilepsy commenced early in life, but who did not come under observation until she was thirty years of age, may have acquired the disease. The others are thought to be congenital. Two of these fifteen admitted as epileptic ultimately proved to be congenital general paralytics.

CASE 17.—The patient's epilepsy commenced at seven years of age and she had an epileptic and alcoholic inheritance. For three years under personal observation she had from two to nine fits monthly, she was then put on Gelineau compound and had three attacks in two years and four months. The attacks then again became more frequent and she was given a course of bismuth and mercury injections, when her fits again ceased for six months and the leg ulceration completely healed.

CASE 133.—The patient had a similar condition of ulceration of legs. She had attacks from the time she was

seven years of age. She was even more resistive to treatment and although her attacks had numbered forty a month, they fell to eight in fourteen months after a course of antisyphilitic treatment.

Of those giving a positive response to the Wassermann test six were treated for syphilis. In one, a child aged thirteen years, whose mother had died of cerebral syphilis, no form of antisyphilitic treatment had any effect on the number of attacks. Of the others, although given bismuth, mercury or "Salvarsan" until no response was obtained to the Wassermann test, the benefit was slight or nil.

CASE 18.—The patient was a child of six and a half years of age whose father was an alcoholic and syphilitic, she made what was apparently a complete recovery after alternate injections of bismuth cream and mercury, she had no attacks after her blood failed to react to the Wassermann test, although formerly she had about twelve a month. After being eighteen months without an attack, she was discharged. She was having other treatment at the same time, including peptone, as she gave a skin reaction to a number of proteins.

Two of the patients admitted as epileptics and yielding a Wassermann reaction, proved to be suffering from congenital general paralysis.

One, a boy aged nineteen years, had a series of forty convulsions when three and a half years of age, commencing twelve hours after he was caned. He had no return until fifteen years of age, when six months after being knocked down by a buggy he had an epileptiform convulsion. These continued to reappear every three or four days up to the time of his admission at nineteen years. His mother had had four miscarriages, then a premature dead child and two years later the patient was born. The patient's blood and cerebro-spinal fluid gave a positive response to the Wassermann test and the cerebro-spinal fluid gave a cell count of fifteen, a positive response to the globulin and gold chloride tests.

The second congenital general paralytic was a boy aged fifteen. At fourteen years he had his first fit after a fall, about ten months later he bumped his head and had another convulsion. At this time his memory began to fail and a month later he was admitted. His cerebro-spinal fluid gave a positive response to the Wassermann, globulin and gold chloride tests, his blood also responded to the Wassermann test.

The first of these two patients may have been an epileptic and later a general paralytic.

To sum up: one patient whose condition was of syphilitic origin, recovered with antisyphilitic treatment. Two patients, the syphilitic nature of whose affection was doubtful, improved with this treatment. The others were unaffected.

Psychic Causes.

The existence of epilepsy of psychic origin seemed to have been proved by Rows and Bond.

I have searched my case records to find some that might be classed under this heading. I have found four patients all cured by treatment, but without the aid of the psychoanalyst and his vivisection of the soul.

In Case 22, already referred to, the patient's mother and seven of her nine children took fits which ceased between the ages of nine and thirteen years. In Case 22 the patient had fits from ten months of age, continuing until she was over thirty years of age. She had been under personal observation for five years. After admission to hospital and without treatment, the number of her attacks fell to less a month than they had been in a day. There was a

further fall with drugs and so things continued for twelve months. In May, 1923, she attended the Hickson mission with apparently no result. The following September a change was made in her mixture. From that day to this she has had no fit and is leading a normal life. After being free from attack for two years she left the hospital. On leaving her faith in Mr. Hickson was not so great that she would give up her medicine, her faith in the medicine was not sufficiently great for her to give up daily prayer for its effective action. Whether faith or drugs played the greater part in her cure, is doubtful.

In Case 33 the epilepsy commenced when the patient was fifteen years of age. This patient was adopted at an early age and nothing is known as to his family history. The adopted mother had an epileptic son who died. The patient had to sleep with this boy and look after him in his fits. He used to become greatly alarmed when he saw a fit and later developed them himself. This was revealed only on the day the boy was discharged. When he was admitted, his epilepsy had been established for five years and the attacks which occurred once or twice a month, appeared to be typical and severe. He had a typical epileptic nature, bad tempered, quarrelsome and so aggressive that he had to be removed from the more peaceful epileptics. He refused treatment and for two years and as it was thought that his condition was hopeless, no attempt was made with him. He then implored that something might be done and promised to reform his conduct. He had no fit from the day he was given an antiepileptic mixture and twelve months later was discharged, a reformed character and in good health.

In Case 128 epilepsy commenced when the patient was eleven years of age after he saw a child in a fit. Although he had been an epileptic for sixteen years before coming under observation, he has remained without a fit for three years with only a few grains of bromide daily to help him.

In Case 157, a lad, aged fifteen and a half years, not feeling well, went to a doctor who is said to have informed him that he had strained his heart and would probably have fits. One month later he took his first fit and for the next nine months had two or three every month. On ordinary treatment he has remained free from attacks for nearly two years.

The fits in these four cases were apparently caused by suggestion, although in Case 22 the patient was only ten months of age when her attacks began. Epileptiform seizures were so common in her family that she may at first have copied one of the elder children, thinking it the right thing to do.

The weak point in these cases from the standpoint of the psychologist is that the sexual considerations play no part in either the causation or cure.

Endocrine Influences.

Aldren Turner remarks: "A quite unjustified degree of importance had been attached to the relation of epilepsy to glandular disturbance." We venture to doubt the correctness of this statement and believe that any glandular disturbance will influence an epilepsy as syphilis will influence any disease with which it may be complicated, and that treating the glandular dystrophy will go a long way to help in treating the epilepsy.

The apituitary condition or *adiposa genitalis* is quite commonly associated with epilepsy. Among this series are seven cases of pronounced glandular dystrophy. But if finer signs of glandular deficiencies are accepted, such as a thyreoid that can be palpated, irregular and abnormal menstruation, hair on face or other abnormal position in women or effeminate distribution in boys, pigment in un-

usual places and a Goetsch reaction, then in eighty-five cases some glandular dysfunction is present.

Among the pronounced cases are the following:

Case 65 was that of a lad of nine years. Six years previously he had been given a dose of diphtheria antitoxin as a precaution. Two months later epileptic fits commenced, at first they were few, but eight months before admission he had from thirteen to forty attacks every day. On admission he was fairly bright mentally. He had a definite white dermagraphic reflex and his hands and feet were bluish and cold. During the first month under observation he had five hundred and sixty-two fits. He was then given suprarenal gland in doses of 0.3 gramme (five grains) every day and bromide and calcium. He had three hundred and three attacks during the first month of treatment, eleven during the second month and nine since then, a period of nine years.

The inference is that the antitoxin damaged his suprarenal activity, which started the necessary chemical or metabolic changes to cause the attack.

Case 12 is that of a girl, twelve years of age, whose epilepsy commenced when she was eight years old. She then weighed 45.9 kilograms (seven stone four pounds) and was 137.5 centimetres (four feet seven inches) in height and her bone formation, skin, hair and general make-up suggested early hyperpituitarism. She menstruated at eight months, did so regularly for six months and then twice yearly until eight years of age and since then regularly. Her short stature in spite of her over active pituitary, is probably brought about by her early ovarian activity. Her thyreoid was distinctly enlarged.

In Case 48 the patient is not unlike that of Case 12 in appearance, but she was twenty-one years of age at the time of observation. She had menstruated only twice, once at seventeen years of age and again six months later. We look upon her as suffering from *dystrophia adiposa genitalis* which produced a delayed puberty, adiposity, retarded development and perhaps the epilepsy. Her epilepsy commenced at eighteen months, she then had a series and was subsequently paralysed in the left arm and leg. She remained in hospital three years and received pituitary and calcium therapy. Her menstrual function was fairly regular, though the monthly number of her fits did not greatly alter. A shower bath would always produce a fit in this patient. One day, without as far as is known any preceding fit, she collapsed and died. Post mortem examination disclosed that there was great distension of the colon and the heart was pushed up after being in the third space. On examination of the brain, the *dura mater* was seen to be thick, the *pia mater* and arachnoid were thick and milky. The right half of the brain was smaller than the left and there was much diffuse redness of the right hemisphere. The left hemisphere weighed four hundred and seventy-five grammes (one pound three-quarters of an ounce) and the right weighed three hundred and thirty-two grammes (eleven and three-quarter ounces).

In Case 94 the patient, a girl, seventeen years of age, was of boyish appearance. She has no mammary development, no axillary or pubic hair and has not menstruated. Her span is greater than her height. Her epilepsy commenced at three years of age. She came under observation at seventeen and made much improvement on anterior pituitary in addition to bromide.

Case 98 is that of a lad of ten years. Two years previously he was knocked down by a car and was unconscious for five days. Before the accident he was a good boy, afterwards a moral degenerate. He was admitted in June, 1916. He had a chest expansion of 7.5 centimetres (three inches), his hands and feet were large and the development of his sexual organs was out of all proportion to his age. Some years later he developed the fat and hair distribution of apituitarism, he lost his eyebrows and the hair of the head became thin and coarse. It is probable that the injury he received, damaged the pituitary

body, the sexual over-development, activity and perversion, being explained by an irritative lesion of the anterior lobe, the effeminate *ensemble* by want of secretion of the posterior lobe, the symptoms of athyreoidism being secondary.

In thirty-eight cases the thyroid could be palpated and we take it that a thyroid gland that can be felt easily, is enlarged. It is not suggested that these patients manifested symptoms of hypo- or hyperthyreoidism. One was distinctly athyreoid and improved both in health and in regard to number of fits with thyroid gland treatment. None was distinctly hyperthyreoid though some might be regarded as approaching this type.

There are twenty-five patients with menstrual irregularities which might be regarded as being due to glandular influence. There is Case 12, one of hyperpituitarism and secondary hyperovarianism, in which the patient commenced to menstruate at eight months. One patient at twenty-five had never menstruated, two commenced after twenty years of age, one at twenty-three years had menstruated twice (once at seventeen and once six months later). Three commenced after seventeen and were irregular. Of the balance the chief abnormality was long periods of amenorrhœa after the establishment of the functions, the periods of amenorrhœa varying from three or four months to eighteen months. In six cases the menstruation commenced at about twelve years of age. In these the periods have always been irregular in time of recurrence and in duration. In one patient the epilepsy commenced early, but the periods not until she was nineteen years old. After this the attacks were said to be much less frequent.

Reaction to the Goetsch test which may be taken as a test for suprarenal sufficiency, or any reaction to a small dose of adrenalin can be taken as indicating at least no under-activity of those glands of the endocrine symptoms stimulated by the sympathetic. The reaction may be shown locally by its general effects or by the production of a glycosuria which generally appears and disappears within five hours. By the last method the intensity of the reaction can best be measured as shown by the time the sugar appears, how long it lasts and the amount excreted. Twenty-nine of these patients gave a reaction to this test and twelve did not react.

We have done the same test in forty cases not included in this series and have obtained an additional twenty-seven reactions, that is, fifty-six reactions among a total of eighty-one patients tested. We used this as an indication for glandular treatment; we looked upon the condition of those patients who manifested a very pronounced and long continued glycosuria as being due to over-action on the sympathetic side, those patients who did not react to a larger dose than usual were regarded as manifesting an under-activity of these or a *plus* activity of the parasympathetic control.

Protein Hypersensitivity.

Wallis and Nicol wrote a paper on protein sensitivity in relation to epilepsy as shown by skin tests. They used five groups of proteins and tested

one hundred and twenty-two epileptic patients of whom forty-six gave reactions and they claim some success by adjusting the diet and giving peptone by the mouth one hour before meals.

We have subjected one hundred and sixteen patients to this test and fifty-six are among the two hundred we have under review, but I shall neglect those and make one class of them.

At first we used nine common food proteins prepared by ourselves. More recently to save time and labour we have used Parke, Davis and Company's group protein, one to twenty-two and twenty-four, twenty-five and twenty-nine. These include all the common foods, two bacterial groups, two epidermal groups and seasonings. Of the one hundred and sixteen, ninety-one gave reactions and twenty-five did not react. Among those giving reactions, with the exception of seven who reacted only to one protein or one group, the reactions were multiple and seventeen reacted to more than half the tests applied, namely in most cases twenty-five. One outstanding feature is that comparatively few react to the meat, egg and milk and colon group, only two reacted to the last named group and thirty-two to the first. The greater number of reactions were in the fish groups, an article of diet not common among patients of a mental hospital, the next most frequent being the vegetable groups. These groups are rather large and the vegetables have not been tested separately. Cereals and fruits also supply a number of reactions.

Contrary to the experience of Wallis and Nicol, omitting the offending articles of diet has with us met with no success. To desensitize these we have given peptone by the mouth in eighteen cases, first in small doses, as advised by Wallis and Nicol, of 0.12 gramme (two grains) once or twice a day, later in doses of 0.42 gramme (seven grains) three times a day as advised by Cook:

The rationale being that owing to some lack of functioning on the part of the liver, a quantity of incompletely hydrolysed protein split products, passing from the portal vein escaped through the liver into the general circulation. This flooding of the blood and tissue by protein derivatives has a shock action which can be prevented by sending a small dose of these proteoses and other substances through the circulation an hour before the larger amount arrives from digestion of a meal.

In five cases no improvement followed. In six there was definite improvement. In one whose epilepsy was associated with Baker's asthma and who reacted to flour, oatmeal, rice, milk and egg, the fits ceased for six months after the patient had peptone. He was so pleased with himself that he left the hospital and has not been heard of since.

A lad who reacted to eight different proteins, and who had generally averaged about five attacks a month, had five in twelve months when given peptone. The attacks of the other eleven diminished in number, but in some of these the diminution was only for a time. We hoped to desensitize some patients to particular proteins as is done in asthma, but the number of proteins to which they react, make it difficult to find suitable subjects for this. The question requires much more study, but we greatly doubt if much success will be found along

these lines. According to our results the reactions are over too wide a range to suggest that any particular protein or group of proteins play any part in the causation of the illness.

Treatment.

A great majority of epileptics can we believe be greatly benefited by treatment, but no rules can be laid down. Each case must be studied by itself and only by individual study both as to drugs, diet and life generally of the patient can benefit be obtained. One patient cannot tolerate bromide, another while taking quite a small dose will have no attack. "Luminal" will work wonders with one and yet with another will be quite useless and so on with all the drugs given for this disease.

At Dr. Ross's suggestion I put two patients on milk and milk alone for as long as they would tolerate it which was about six weeks. Both patients had averaged about eight fits a month, one did not have any during the time of treatment, the other had several attacks a day.

It is difficult to speak of recoveries in regard to epilepsy, but we claim to have improved twenty-one of these patients to such an extent that they are apparently cured. Among the twenty-one are the five whose epilepsy was thought to be of psychic origin, also the congenital syphilitic child, Case 17, and Case 65, the boy who made such improvement with suprarenal extract already described, and Case 161, the girl who had no attack after intestinal parasites were removed.

Among the others was a lad (Case 121), aged twenty, whose fits commenced within a few hours of a kick on the head in the football field when he was thirteen years old. Since then he had had one or two attacks a month. He was given parathyroid one-tenth of a grain, on not too sound reasoning, but because he had tremors and twitchings about an hour before the attacks. He was also given quite minute doses of bromide and sodium bichlorate. This was two years ago. He has not had a fit since, although during this time he has married and taken over together with outstanding debts a large farm which he works.

Case 124 was that of an epileptic of twelve years' standing whose fits commenced at sixteen years of age. He has kept without fits for six years on "Luminal" sodium. For four years he was in mental hospitals, for the last five he has been earning his living. After being free for six years he had one attack after working much overtime in a hot atmosphere.

Case 2 is that of an occasional epileptic whose fits increased in numbers after an anæsthetic. He remained free from fits for two years on suprarenal extract in addition to the more usual treatment. He had a recurrence after another anæsthetic and since then has not reported, so probably he remains free. He did not react to the Goetsch test.

In Case 16 the patient whose attacks came on after a fright from bullocks when seven years old, has remained free from attacks for four years on similar treatment. He did not react to the Goetsch test.

In Case 122 the epilepsy of a boy, aged eight years, commenced when he was three and a half years old, after he had eaten unripe fruit. Because of gastric stasis and low blood pressure he was given suprarenal extract together with bromide of ammonia. He had one fit during the third month of treatment, but has had none since and it is now three years ago.

Two children who have remained free from attacks for some years were given thymus extract. One was a girl

aged twelve years, whose menstrual functions had been established six months, the other was a boy who had grown and developed quickly. Thymus was given to them in hopes of delaying development.

In Case 141 the patient came under observation when fifteen years old. At the time she was having about forty fits a month. On bromide and calcium she remained free for five years. She then married and became pregnant with a recurrence of the attacks, having seventy or more a month. Since confinement these have almost ceased.

The rest did well with bromide and sodium bichlorate in one form or another, but three cases are worthy of special mention.

In Case 120 the epilepsy commenced when the patient was between five and six years of age. He was admitted when twenty-three years old. He averaged fourteen fits a month and was treated in many ways. In January, 1922, was given bichlorate of soda in addition to bromides. In May of that year he had four attacks and has had none since. He is now out and reports at regular intervals.

The patients in Cases 32 and 35 are similar. Both were confirmed and obstinate epileptics and the condition in both commenced in early life. In Case 35 the patient had been in hospital for five years and the patient in Case 32 for two years without much benefit. Neither have had a fit for five and a half years since receiving bichlorate of soda and one has completely changed in character, whereas he was vegetative he is now an active and useful patient.

A complete cure resulted in Case 138, the patient's condition might be regarded as either of psychic or of endocrine origin. She was fourteen when admitted, a State child who at part of her career had had a very hard life, but more recently had been in a happier home. She had however been too willing and had been thoughtlessly overworked. She was admitted in a dull, stuporous condition with a history of having taken fits during the previous twelve months. During the first three months in hospital she had fifteen attacks. Remaining extremely dull, she was given 0.06 gramme (one grain) of thyroloid daily. After a few days she became extremely lively and active, in fact almost in a condition of hyperthyroidism, for which she was later given thymus. After a few ups and downs she was discharged and is leading a normal life. She has had no epileptiform attacks since except one series of six three months after taking the thyroloid, when life was not going well with her. For three and a half years she has been quite free.

Among those whose attacks had been greatly reduced or for long periods had been without attacks are the following:

The patient in Case 45 had apituitary fat distribution. She was treated for two and a half years with some relief and had no fit for eighteen months when whole gland pituitary was added to the existing treatment. Two patients had given a reaction to many proteins and after the administration of peptone had about as many fits a year as they had previously had per month.

Of the numerous drugs and treatment advocated for epilepsy many of them, such as palladium, seem to fade almost as soon as they are announced. We believe that the bromides are the first and surest help, but the dose needs adjusting for each patient. Next to bromides sodium bichlorate is the most valuable drug, alone in our hands it has been of no use. Combined with bromides even in old standing and apparently hopeless cases, the results sometimes have been little less than miraculous. "Luminal" is very useful with some patients. It is best combined with bromide and again the dose needs adjusting for each patient. Glandular treatment is a decided help when there is an indication, but often the indication is indefinite and might by sceptics be called imaginary.

ON IRRITABLE ULCER OF THE LEG OR MALLEOLUS, AND ITS CURE BY OPERATION.

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IRRITABLE ulcer of the leg, or of the malleolus, is an ailment which causes a great deal of suffering to its victims, it is liable to be very chronic, and it is very resistant to all ordinary forms of treatment. For a number of years—I do not have the same opportunities now—I used to see cases not very infrequently. The miserable condition of the patients, the refractory nature of the disease, and the fact that it seemed to belong to a class by itself attracted my interest and induced me to make a study of it. In the course of this study I accumulated a large stock of notes on a considerable number of cases, and devoted a good deal of thought to the questions involved. Experimenting with treatment, I devised an operation, primarily intended to relieve pain. This was a success, immediate, complete, and unfailing. But it did more than relieve the pain. It cured the ulcer too.

I can say now that these lesions are not difficult to cure, and the method is so simple, so rapid, and so certain that it is difficult to understand why it is not mentioned at once in every textbook. It is likely enough that others have discovered the technique for themselves, but so far as I am concerned, the method is original. There are some hints in certain textbooks which, if carried out, should have led to the development of a curative technique similar to my own, but they do not seem to have done so. I do not claim, however, to have made an exhaustive search of the literature.

I wrote in rough form a paper on this subject some years ago, embodying some of the present material, but I thought it better to wait and watch the further history of some patients. Circumstances intervened to delay the completion of the work, but I am satisfied that it can be put forward now with the confidence of a full experience.

I have consulted a number of textbooks, surgical and dermatological, by English and American authors, to see what they had to say about the subject. Not all English textbooks of surgery mention it. For some of them it does not exist, or is too trivial to discuss. When the subject is mentioned, it is usually given no more than a few lines of slight and sketchy notice. American textbooks of surgery take even less notice. In the books on dermatology, English and American, I could find no place for it at all.

Some writers describe the irritable ulcer as a condition only, and as they view it, an ulcer may assume an "irritable state," and this "irritable state" is particularly liable to complicate ulcers near the malleoli. They would include under the term any ulcer which is intensely painful.

Another point of view is found expressed in the statement that neuralgia may occur in association

with an ulcer in people predisposed to neuralgia. The student is told to be on his guard against considering the pain of these ulcers as an intrinsic feature, and he is instructed that the proper treatment is general treatment suitable for neuralgia.

Another exposition of opinion regards the cause as a local one, depending on the presence of an exposed nerve-ending in the ulcer.

On the whole, writers favour the restriction of the name "irritable ulcer" to a small and painful type of chronic ulcer usually situated near one of the malleoli.

As to treatment recommended by authors, I have already referred to the line of treatment deduced from the neuralgia theory. But the majority of opinions favour local methods. I find the following topical applications recommended; strong solution of silver nitrate, solid silver nitrate stick, carbolic oil, carbolized glycerine, pure carbolic acid, chloral hydrate, strong solution of zinc chloride. Further steps suggested are thorough scraping under an anæsthetic, or radical removal by excision, followed by grafting. Several students' manuals refer to Hilton as having said that if the surface of an irritable ulcer be lightly explored with a probe, spots of tenderness may be discovered, the rest of the ulcer being insensitive, and it is suggested that these tender spots should be discovered, and that then the granulation tissue of the ulcer (or the skin immediately above), should be incised so as to divide the filament of nerve inferred to be there exposed. The exact *locus* of the reference to Hilton is not given.

My own observations hardly support the statement that spots of tenderness exist on the surface of an irritable ulcer. Some of the ulcers are so small that probing is as likely to touch the margin as the surface, and it is then difficult to be accurate. The tender spots are there, but when the ulcer has been large enough to permit of accurate observations being made, I have found the tender spots, not on the surface, but at the margin, and only on the proximal part of the margin. The tenderness seems to involve the whole proximal edge, though one or two spots may be worse than the rest. Still, it is quite possible that sometimes tender spots do occur on the surface.

We are told by several writers that irritable ulcer usually occurs in neurotic women, and that it is associated with some disorder of the uterine functions. I am unable to confirm this. I will say more. The statements about neurotic women and about menstrual disorders are altogether pointless unless they are intended to mean that the connexion is more than casual. No doubt it is true that many neurotic women suffer from irritable ulcer, and it would be more than likely that the pain in such individuals would be felt more acutely. But exactly the same remark would apply equally well to a neurotic woman with a painful corn on her toe. Moreover, constant pain and continued interference with sleep would probably render many otherwise normal people "neurotic" after a few months of it—or perhaps a few weeks, or a few days, of it.

And as regards menstrual disorders, is the connexion causal or casual? I have been unable to discover any special connexion, and I regard the statement as a random shot. As to a further statement that irritable ulcer is most common in women about the period of the menopause, I would prefer to put it that the trouble is relatively frequent in women between forty and fifty years of age, but I have seen it in women many years before and many years after the menopause. I have, moreover, seen two typical cases in men.

Clinical Features of the Disease.

I have described textbook references as sketchy and slight. Perhaps this defect is unavoidable in notices that have to be compressed into very few words, and there is so much variety in individual cases that it is not possible to make a general description very satisfactory. Yet, as I have been thus critical, I should contribute an attempt at something less slight and less sketchy.

Over the lateral, or just behind the medial malleolus are seen a few small horny or scab-like concretions of dry scaly material consisting apparently of desquamated epithelium caked or glued together into a mass. These vary in size from that of a pin's head to a mass several millimetres in diameter. Almost invariably the largest lesion is the highest, or most proximal, and the rest spread out in scattered fashion below it. This uppermost lesion may at times be covered also with a heap of the scab-like material, but if of any size it is naked of covering and shows as a small crater in the skin exposing an ulcer-like base. This is the "irritable ulcer." It is usually exquisitely tender, but its tenderness varies in different cases. The patient complains of pain chiefly centred in the ulcer, but radiating from it and including the area exhibiting the scaly spots. The pain is darting in character when severe, and it is often very severe indeed; it is worse at night, and worse after much walking and standing. The pain is out of all proportion to the severity of the inflammatory reaction. One or two of the other spots may exhibit great tenderness if the scaly covering be pressed upon, but the ulcer is always the chief centre of pain. If the malleolus be fomented, the concretions come off the other lesions, and they are revealed as little red depressed spots, or pits, in the skin, not necessarily distinctly ulcerated, usually not. If the disease has lasted any considerable time, or after healing, the part exhibits a mottled appearance, being stippled with cicatrices, which seem to mark the site of at least some of these minor lesions, and this mottled cicatrization remains as a permanent relic of the disease.

But cases vary. The description just given should not be regarded as rigid. Therefore I help it out with some clinical records. These are from old material, but in the first two quoted I have retained the original present tense.

CASE I.—Just admitted to the hospital (April, 1921) is a patient, Mrs. E.B., aged forty-three, on whom I operated in June, 1917, for irritable ulcer of the right lateral

malleolus, followed by immediate cure. From that time to this it has remained absolutely well, but she now has on the right medial malleolus what one must recognize as the same disease, but without (up to the present) an ulcer. The area affected shows some small dusky-red, tender papules. Some of the lower papules are scaly, and there is also already some slight cicatricial mottling. The epithelial covering is intact, but thin. The part is tender, but not acutely so. It is the seat of a burning pain, lancinating when severe.

As to this case, there arises the purely formal objection that it cannot be described as one of "irritable ulcer," except by convention, because there is no ulcer. That is quite correct, but for the present the nomenclature will have to bear it. It is the thing that matters, and whatever the name, the disease is obviously the same.

This particular case is important because it shows that the pain of irritable ulcer is not necessarily all due to the exposure of a nerve. The pain was antecedent. The ulcer and the nerve-exposure must be secondary to a prior pathological influence. It seems to me to be a trophoneurosis. The nerve is a diseased nerve before it becomes exposed in the ulcer. But, once formed, the lesion seems to maintain itself by some sort of vicious circle, a circle which can be broken (as I have found) by section of the nerve-supply.

This same patient, just referred to, had many years ago an irritable ulcer of the left medial malleolus which lasted, in varying severity, for at least two years, and then gradually healed, with disappearance of the pain. I remember her well as attending my surgical out-patient clinic at that time, while I was still an assistant surgeon. Now she has developed a recurrence on the same malleolus. There is a small, punched out, oval ulcer about six millimetres in vertical diameter and three millimetres in horizontal diameter. This presents acute tenderness, and is subject to the same characteristic darting pain. There are no crusted spots or areas, but there is a good deal of old, mottled, thin cicatrization in the skin below the ulcer. The malleolus which formed the site of the ulcer operated on four years ago presents the same mottling or stippling with white cicatricial tissue. The scarring is only delicate and superficial, not thick, and does not resemble that which follows total destruction of the skin. It is more like what follows chronic congestion. This patient is the subject of very bad and very general varicosity of the smaller veins of the leg, of the sort that sometimes follows pregnancy, as it did in her case. The history of the recurrence is worth some attention. She stated that the part had remained apparently well for years, but in January, 1918, she received a hard knock on the malleolus. A week later there developed a condition of a description something like local dermatitis. This continued to be painful, more or less, and in December, 1919, 22 months later, irritable ulcer of the typical kind appeared. This was six months before the date of the clinical description given above, the ulcer having been present all that time.

Here is another case.

CASE II.—The patient, Mrs. W.J.W., has a small chronic irritable ulcer, not near a malleolus, but otherwise characteristic, situated on the front of the leg close to, but not actually over the shin, and about the level of the junction of the middle and lower third of the leg. This ulcer presents a recurring tendency to crust formation such as I have described. The patient is the subject of very numerous small varicose veins and dilated venules.

I describe next another case which provides material for thought, though it did not present an ulcer, and the patient was not operated on.

CASE III.—Mrs. J.A.W., seen in April, 1919, had a comparatively healthy skin everywhere, except over an area

about the middle of one leg, and a little to the outer side. Its size was approximately eight centimetres vertically and four centimetres transversely. It was strictly and sharply demarcated, having normal skin right up to the edge of the patch, little or no congestive areola being visible around it. The patch presented the appearance of a plaque of dirty brown scab-like material, seemingly consisting of heaped-up desquamated epithelium, precisely like what one sees accompanying irritable ulcer of the malleolus, but here it was not in spots or small masses, but a large plaque. The symptom complained of was an aching pain referred to the whole patch, worse after much walking or standing. There was no irritable ulcer. But the patient gave a history that set me wondering whether we had not here something very similar in character to the disease that is usually met with on the malleoli. She had had this plaque for a number of years. At the lower part of the area, she had suffered for years from a small, quite tiny, exquisitely tender raw spot that used to form, being sometimes covered and sometimes exposed. The pain of this spot used to be so excruciating that it made life a misery, but for the past two years she had been comparatively free from severe pain in it. In this patient there were numerous small bluish dilated venules on both legs, but there were no large varices.

Though I did not operate on this patient, if a similar case came before me again I would do so, using the same technique that I have found so successful in irritable ulcer. It would do no harm, and on the experience I have had, I think there is ground for a reasonable expectation that it would cause the whole patch to clear up.

CASE IV.—Another patient, Mrs. J.H., had no more than slight varicose veins, but poor general health. I operated on her in March, 1917, for irritable ulcer of the left lateral malleolus. In September, 1918, I operated for a similar condition on the medial malleolus on the same limb. The operation in each case caused the pain to disappear at once, and the ulcer to heal in a few days. But three years afterwards she developed certain pathological conditions about 2.5 centimetres (an inch) lower down on each side, well below the malleoli. There were no ulcers, but small patches of heaped up epithelium and some brownish pigmentation of the skin. There was another patch on the dorsum of the foot near the toes, and still another on the front of the leg, the last one consisting of a small patch of infiltrated skin, dusky-red and dry, with a flaky surface. These various areas were each the site of severe neuralgic pain, extremely like that which is associated with irritable ulcer. The patient was very ill, and she died some time later of pulmonary tuberculosis.

I think the patches described were in all probability manifestations of the same disease as caused her irritable ulcers, but at a less advanced stage. Perhaps there is less tendency to formation of ulcers when the disease is away from the malleoli, and the skin better protected.

CASE V.—Miss K.B., aged fifty-two, a cook, was operated on by me in February, 1919, for an irritable ulcer over the left medial malleolus which she said had been present for eight years. The typical symptoms were present. The pain was relieved immediately, and the ulcer was healed in a week. But in February, 1921, she returned with a patch on the dorsum of the right foot about 1.5 centimetres in diameter, presenting a dusky-red irregular surface, not ulcerated, but still covered with thin epithelium. It had been present for two months, and was the seat of severe shooting pain, especially at night. It seemed to me to be the same disease, but not yet advanced to the stage of ulcer. She was put to bed for some six weeks, at the end of which time the pain had disappeared, and the patch had practically recovered. There remained, and still remains, a dark pigmented stain. I have seen this patient at intervals ever since. There has been no further manifestation of the disease. It is now ten years since the operation.

Another point to remark about this patient was that though varicose veins are frequently present in these cases, she had none. But though no actual varicosity was apparent, she had a great deal of standing to do, and seemed to have a poor circulation in the lower limbs.

CASE VI.—I saw Mrs. F., aged fifty-four, in June, 1920. She had two irritable ulcers on the left lower limb, one over the medial malleolus, the other over the lateral malleolus. The other limb was all right. She was the subject of slight varicose veins. The ulcer over the left medial malleolus was the largest irritable ulcer I have seen, about two centimetres in diameter (see Figure I). It was the seat of very great pain. When probed, it was tender to touch at the skin edge on the proximal portion of the circumference, but not tender elsewhere. There was some redness around. The lesion made its first appearance two years before as a dark reddish area. Nine months later there was an ulcer present, but it remained very small

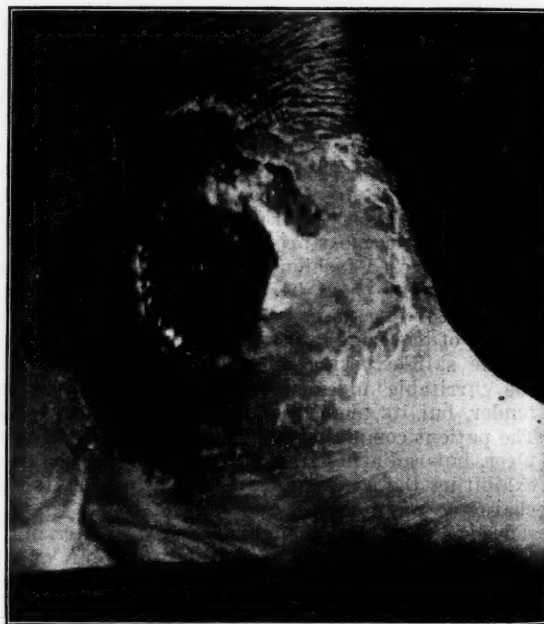


FIGURE I (Mrs. F.).
Showing Large Irritable Ulcer (see text). (Photograph by Dr. H. R. Scrivener, June 22, 1920.)

for many months, and then grew larger. The lesion on the lateral malleolus began as a dark mark which persisted for a long time before the ulcer came, but the dark mark was not painful. Now there was a small ulcer about three millimetres in diameter, which had made its appearance six weeks before. Anterior to the small lateral ulcer there was a patch of chronic congestion with pigmentation. This was also involved in the pain. Below the lateral ulcer was a small scab-like concretion of hard epithelium. The concretion was removed by fomentation, and left a pit in the skin, not an ulcer. Both malleoli were operated on, followed by immediate relief of the pain and speedy healing, but the dates of healing are not recorded in my notes. My notes record that there was an attack of lymphangitis, marked by a red line above the lateral malleolus, but that the medial malleolus was unaffected. The infection did not appreciably retard healing.

CASE VII.—Mrs. W.P.G., aged about fifty-five, had had a small irritable ulcer about 2.5 centimetres above the right

medial malleolus for about two months. The ulcer was in the upper part of a well-demarcated patch of dark congested skin about twice as long as broad. The skin was very tender over the whole patch. She had a number of small purplish dilated venules on the leg. Operation was done on May 18, 1921, and the ulcer was healed on May 24, six days after the operation. I saw her again on January 30, 1925, three years and nine months after the operation. There had never been any pain or other trouble at the site since the operation.

CASE VIII.—Mrs. M., aged forty-one, had an irritable ulcer about 2.5 centimetres above the right medial malleolus. It was about one centimetre in diameter. At one examination with the probe I thought I could find two tender spots, but on another occasion only one spot. On both occasions the tenderness was exclusively at the proximal part of the margin, the rest being insensitive. She stated that the ulcer began six years before. It was very small for five years, but it was very painful, especially at night. She could never walk without severe neuralgic pain. In the past year it had increased in size and grown

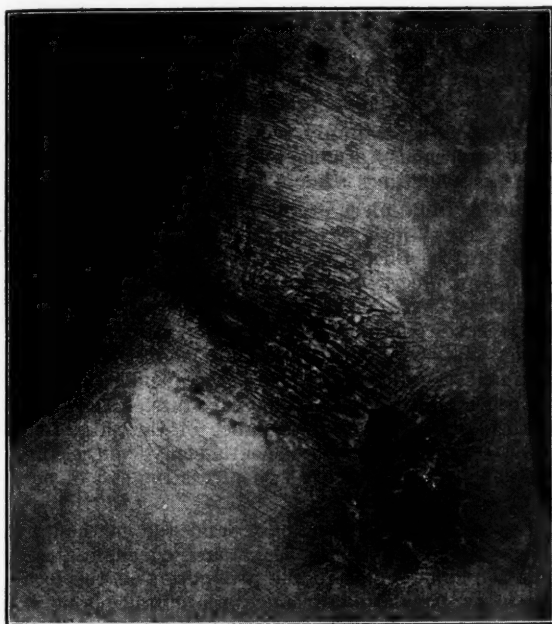


FIGURE II (Mrs. M.).

Showing Two Irritable Ulcers of Malleolus. The red colour of the area round the upper ulcer appears as black in the photograph. This gives it a larger appearance than it should have. The lower ulcer was the painful lesion that had cost £300. (Photograph by Dr. H. R. Scrivener, July 20, 1921.)

deeper, and had been extremely painful. The leg presented some very small dilated venules, but no varicose veins of the ordinary kind. There was another small punched-out ulcer about 0.2 centimetre in diameter a little above the larger one (see Figure II). This had developed recently. It had a tender spot at the proximal edge. Operation was done July 21, 1921. On July 28 the upper ulcer was quite healed. On August 5, two weeks after operation, the lower ulcer, the one which had existed for six years, was quite healed. The patient told me that this ulcer had cost her husband over £300 in the past six years, and that it had resisted all treatment, including several periods of bed. She had had many doctors. She was very grateful—but her money had been spent by the time she came to me. I saw her on June 12, 1924, three years afterwards. The place had remained well, and it was evident that she had been completely cured.

CASE IX.—Here is an account of an ulcer in a male patient. This man, aged thirty-two, a shop assistant, stated that he had had varicose veins since the age of fifteen. At the age of twenty, the veins were operated on, but they recurred in less than a year. He had an irritable ulcer of fifteen months' duration over the right medial malleolus, and another of nine months' duration over the left medial malleolus. They were both the sites of great pain. There were numerous varicose veins on both legs, but not in the lower part. The cicatrices left by the previous operation could be seen. In March, 1922, I removed the veins, and did my usual operation for the irritable ulcers. The ulcer on the right malleolus was healed in four days, and that on the left in ten days. He came to show himself two years afterwards, and reported that he had never had an ache nor a pain since. He had gained 18.9 kilograms (three stone) in weight. But the veins had again become varicose. Normal sensation had returned over both malleoli. However, he came back a few months later with another typical irritable ulcer below the right medial malleolus, which I operated on once more. This was followed by immediate relief and healing. But unfortunately, six months later he developed an abscess over the right medial malleolus which broke and left an ulcer. This ulcer had the characteristics of an ordinary indolent ulcer, without the neuralgic pain of irritable ulcer. The site of the old irritable ulcer over the medial malleolus of the other leg had remained quite well.

I could give some other cases, but the list is long enough. I may say, however, that I am not holding back any because operations were failures. There has not been a single failure. In every one the pain has been stopped immediately, and the ulcer has healed in about a week. A specially large ulcer would naturally take longer, but a week suffices for most. There are some cases in which the patients have not been seen again; Mrs. F. in the above list is one of them. But it is evident that though the patients have not been given new bodies or new legs, and cannot be guaranteed against manifestations of the same disease in other situations, they have been relieved of pain for long periods.

Treatment.

Mention has already been made of the advice given in textbooks. For my own part, I have tried many remedies. Prolonged rest in bed relieves the pain, but it is made much worse by much walking or standing. Treatment directed towards the relief of associated varicose veins is a help likely to be of considerable value. Topical applications are at best unreliable and not very effectual palliatives. Application of the solid stick of silver nitrate causes a good deal of immediate pain, followed by partial relief for perhaps a week. In my experience, it does no more. I have never excised the part and grafted new skin, nor have I ever curetted the ulcer under an anæsthetic.

Although it is true that incision immediately above the tender spot has been mentioned in textbooks as suitable treatment for an exposed nerve-ending, my own method is something more than this. I have never attempted to section a nerve by an incision within the ulcerated area or at the skin margin immediately above, and if I had practised it I think I would not have succeeded in bringing about a cure of the whole lesion, for the effect would have been too limited.

Of course, when I did my first operation I had not learnt so much about the disease as I have since,

though I have much to learn yet. I was puzzled to know why it was so resistant against treatment and so persistently chronic, and I was very dissatisfied with the poor success attained by myself, and apparently by everybody else, in our efforts to relieve the misery of sufferers. The disease seemed to me to depend on a pathological condition of a cutaneous nerve, and even at that time I thought I could see more in it than merely the exposure of a nerve-ending in an ulcer. It occurred to me to try the effect of sectioning the whole nerve supply of the affected area. I thought this ought to relieve the pain, and it was worth trying, since nothing else did. I put it to the test at once, adopting as the technique of the first case the same procedure that I have followed ever since. The result was deeply interesting. The pain disappeared immediately, just as I had hoped and expected. That the ulcer should heal in a week I had not expected. But this it did. The result was like a miracle, a miracle which had broken an evil spell. The patient got well in an incredibly short time—and remained well.

I am not now publishing half-baked observations. I waited to make a more thorough study, to enlarge my experience, and to follow the after-history of patients. What that experience has been is set down in the case histories recorded above.

Need I hesitate to say now that the old tinkering treatment of irritable ulcer should be abandoned, and replaced by an operation similar to that practised in the cases recorded? The old methods are poor and inefficient, and some of them, such as canterization, are cruelly painful. The operative treatment is safe, painless, immediate, and unailing.

Technique of the Operation.

The method involves a minor operation with a tenotomy knife under local anaesthesia. Put the patient to bed for a preliminary rest-period of two or three days with the leg well elevated. Foment the part till clean. The local anaesthetic is a solution of "Novocain," 0.5% (I have also used cocaine, 0.1%), in normal saline containing adrenalin, one in 150,000. Infiltrate the subcutaneous tissue above and on either side of the diseased area (the whole of it, not the ulcer merely). Wait a few minutes. Make a small incision in the skin above the diseased area just sufficient to admit a long-bladed tenotomy knife, and push this down on either side so as to sever all the tissues from just beneath the skin down to the deep fascia or the bone. I turn the blade carefully towards the skin so as to make sure of severing all the subcutaneous tissue, and then turn it towards the deeper parts, usually with a slight undercutting slant, and cut right down to the bone if it is the lateral malleolus, or on to the deep fascia close to the bone if it is the medial malleolus, taking care not to go deep enough to enter the deep compartment containing the vessels. Thus on either side is produced a subcutaneous division of the tissues in the shape of an inverted V. Great care is taken to insure that the incision at the apex or

angle of the V is equally deep, so as to divide all nerve supply. If the patient has a varicose vein close to the apex of the V, as in one of my cases, excise a short length of the vein. Having completed the operation, put on a dry dressing and elevate the leg well. Keep the patient in bed for a week or ten days. The wound should not be interfered with after the operation, one dressing being all that is required.

The pain disappears at once. The ulcer and other lesions heal in a few days. A patch of anaesthesia remains in the skin over and below the malleolus.

Conclusions.

The disease under discussion does not consist merely in the exposure of a nerve-ending in an ulcer, though an exposed nerve-ending, if it could not heal by natural means, would certainly cause pain and tenderness, and in an irritable ulcer it becomes a factor.

It is impossible, after studying cases, to regard the disease as a mere case of ulcer associated with neuralgia in a person predisposed to neuralgia.

I think it is certainly true, as some writers say, that an ulcer may assume an "irritable state." One sees this sometimes after a haemorrhoids operation.

But irritable ulcer of the malleolus is something more. The pain, and often the tenderness, is antecedent to the formation of an ulcer. There is not always an ulcer. See Mrs. B.'s case, right medial malleolus; Mrs. J.H.'s case, the recurrences; Miss K.B.'s case, dorsum of right foot; Mrs. F.'s case, earlier history of lesion over left medial malleolus. Again, in the disease we are here considering there are other signs of a pathological state. There is a localized nutritional disturbance of the skin, it is scaly, sometimes pitted beneath scaly concretions, and sometimes there are two ulcers instead of one, as in Mrs. M.'s case.

The character of the pain, and the method by which the pain and the lesion are cured, indicate that the chief factor in the production of the local lesion is a morbid disturbance in a cutaneous nerve. When once established, it seems to perpetuate itself by the influence of some sort of vicious circle, a circle which is broken by sectioning the nerve.

The case histories make evident a feature of the disease not brought out in the descriptions found in textbooks. It is shown very clearly that some individuals display a marked predisposition towards the incidence of irritable ulcer. They show a remarkable tendency to multiplication or repetition of the characteristic lesion in other parts of the same limb or in the opposite limb. It is obvious that there is something that favours their formation in such people. There is always some circulatory inefficiency in the legs of sufferers, but though ordinary varicose veins are frequent, they are not invariable accompaniments. There seems to be a greater tendency to formation of irritable ulcer in limbs showing a large number of bluish or purplish dilated venules. Without doubt, the purplish leg is a type specially liable to attacks.

Summary.

Irritable ulcer of the malleolus is a pathological entity with definite clinical characteristics. Though most frequent over the malleoli, it may occur in other situations. It depends on a morbid change in a cutaneous nerve. The ulcer is not the primary lesion, but a development in the course of the disease. Nerve-endings exposed in the ulcer form a factor in the production of pain, but pain precedes the formation of ulcer. There may be more than one ulcer at the site of the disease. The limb on which the lesion is situated shows signs of a defective circulatory apparatus. Certain individuals display a marked predisposition towards manifestations of the disease. It is not unusual to find two separate lesions of the same kind in the same individual at the same time, and there is a tendency towards fresh outbreaks. These are not necessarily always on the same limb. The lesions are extremely refractory to treatment usually considered suitable for ulcers, but even though they have defied other treatment for years, they can be cured in a few days by subcutaneous section of the nerve supply. In a series of cases there have been no failures, and the cure seems to be complete and lasting. But the operation does not influence the individual predisposition, and therefore does not protect against new outbreaks in other malleoli or elsewhere. It is claimed that the evidence is so abundant, so strong, and so satisfactory that the older methods of treatment should be abandoned, and that early operative treatment should now be adopted as the routine.

OPERATION FOR BUNION.

By G. A. HAGENAUER, M.B., B.S.,
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IN *hallux valgus* the last phalanx of the big toe is deviated inwards across the second toe towards the middle line of the foot.

The enlarged head of the metatarsal bone is pushed outwards, causing part of its articulating surface to be no longer in apposition with that of the phalanx. Between this enlarged head and the skin a bursa forms which frequently becomes inflamed, giving rise to a bunion.

There are several operations for the relief of this common and very painful condition. The incision usually made is on the outer surface of the foot (the word "outer" and "inner" are used in relation to the middle line of the foot and not of the body).

In the following operation the outer surface of the foot is left intact, thus obviating any trouble which is likely to arise from pressure of a boot or shoe on the scar.

The incision is made between the big toe and the second toe through the skin and underlying tissues extending dorsally to beyond the metatarso-phalangeal joints and to the same distance on the plantar surface. The wound thus made allows the

metatarso-phalangeal joint to be easily opened on its inner side with the point of a scalpel. The big toe is then forcibly dislocated outwards, the head of the metatarsal bone shooting into the wound. After being freed the head is amputated just beyond the articular surface obliquely so that when the big toe is replaced it will be slightly in the over corrected position. This over correction will rectify itself later on. The wound is now stitched and dressing applied. As is usual in bad cases of bunion with deformity of toes, a callous mass or corn forms on the plantar surface of the foot resulting from unequal pressure of the foot when walking. This should be excised at the time of operation. The patient is allowed to walk in a week or so. The results are excellent. A stiff toe does not result.

The incision used in this operation is far superior to that on the outer side of the foot. It gives much freer access to the metatarsal head. It has the great advantage of allowing the second toe to be dealt with in cases of great deformity and it does away with the risk of a painful scar.

Reports of Cases.

GAS INFECTIONS OF THE UTERUS WITH JAUNDICE
DUE TO *BACILLUS WELCHII* FOLLOWING
ABORTIONS.

By RUPERT MAGAREY, M.B., B.S. (Adelaide),
Honorary Assistant Gynaecologist, Adelaide Hospital;
J. BURTON CLELAND, M.D. (Sydney),
Marks Professor of Pathology, University of Adelaide;

AND

J. G. SLEEMAN, M.B., B.S. (Melbourne).
Medical Superintendent, Adelaide
Hospital.

IN the Adelaide Hospital since the year 1920 a series of fatal cases following abortions has occurred in which jaundice was usually a prominent sign. The downward progress of the patients was usually rapid, death occurring in two or three days from the onset of uterine bleeding. During the period mentioned there have been six definite cases of this type and we have also done a *post mortem* examination on the body of a private patient who was under the care of Dr. Beare. All these seven patients were jaundiced. In addition there were three probable cases of the same kind, in only one of which there was jaundice and that was slight. There were also three possible cases coming under the same category. The condition is one of the commonest causes of loss of life following abortion in Adelaide Hospital patients.

In some of the earlier cases it was not possible to be certain as to the causative organism of the condition. Our recent experiences and more particularly the two cases herein described, have enabled us clearly to ascribe the liver changes and the toxæmia and death to the *Bacillus welchii*. Gas infections of the uterus of this kind are not unknown; nevertheless they seem rare. References to them are as a rule casual, as for instance in the report of the London Committee on Puerperal Sepsis, presented to the Fifth British Congress of Obstetrics and Gynaecology in 1925 (*The British Medical Journal*, April 25, 1925, page 732). In this report in a summary of the *post mortem* findings in thirty-five fatal cases there was one example of gas-forming organisms in the uterus, liver and large blood vessels.

Dr. Keith Inglis in THE MEDICAL JOURNAL OF AUSTRALIA of January 6, 1923, at page 8, describes three interesting

cases similar to those met with by us. These patients had all aborted in the early months of pregnancy, were jaundiced and had kidneys which were intensely dark in colour, due evidently to hæmoglobinuria. The blood count in one showed that the red cells had fallen to 1,370,000. The skin of these patients became intensely dark, almost black in colour, apparently from the formation of methæmoglobin. One of his patients was sent in with the provisional diagnosis of acute yellow atrophy of the liver. It seems quite likely that some cases occurring in pregnancy and considered to be due to this disease, are really examples of "gas infections."

It would seem that in Adelaide during recent years there have been an undue number of infections of the uterus with anaerobic gas-forming organisms. The patients have all aborted at an early period of pregnancy, from the second to the fifth month. All have denied interference, but we have thought in all instances that such interference had probably taken place, although there was no evidence of it. It has seemed to us that the most likely explanation of how the gas-forming bacteria had reached the interior of the uterus was by the introduction of faecal specks at the end of some implement used for bringing about the abortion. The vulval hairs and orifice must frequently be contaminated with bacteria of faecal origin. The passage of an instrument, unless in expert hands and after thorough cleansing, must surely be likely from time to time to carry faecal material containing organisms into the interior of the uterus. Once lodged there and the abortion commencing, the anaerobic organisms might find in blood clot and necrotic material in the uterine cavity an excellent nidus for their development. Considerable multiplication could here occur leading to some surrounding necrosis of injured tissue. The clots occurring in the uterine veins are probably later invaded.

To the hæmolytic activities and toxins produced by *Bacillus welchii* in this situation we have attributed the hæmorrhagic appearance of the broad ligament in some of these cases. *Bacillus welchii* or its allies, multiplying in the uterine cavity or in the broad ligament under suitable anaerobic conditions, would be swept from time to time in considerable numbers into the blood stream. Here they would meet with unfavourable conditions for multiplication, namely the presence of oxygen. Some get caught in the liver, where the presence of glycogen probably favours their multiplication. Scattered necrotic foci rapidly develop, contributing in part to the jaundice. Hæmolytic toxins absorbed from such foci in the liver cause a destruction of red cells in the circulating blood. In one of the cases about to be detailed the blood destruction was extraordinary. The red cells were reduced from the presumably normal, four and a half millions to under two millions in the course of a few hours. The serum became laden with hæmoglobin and methæmoglobin and there was intense hæmoglobinuria. In this case *Bacillus welchii* was detected in the circulating blood and had probably reached this situation by being leached out from the foci in the liver. We are inclined to think, therefore, that the jaundice is chiefly hæmolytic, but is contributed to by absorption from patches of necrotic and injured liver cells.

If these patients have aborted naturally and without any interference then it is difficult to understand how the anaerobes could have entered the uterus. We think it must reasonably be assumed that their origin is from faecal material. One of us is carrying out a series of investigations as to the frequency of organisms of this class and other faecal bacteria in the vagina and in the uterine cavity after abortions and confinements. Such anaerobes are found present with considerable frequency. It seems possible that when abortion has commenced so that there is bleeding into the vagina, anaerobic bacteria contaminating the vulva might find their way upwards in the fluid and so finally reach the interior of the uterus. Their progress would be more rapid on fingers or on instruments.

It is now known that a very successful antitoxic serum can be obtained for the treatment of *Bacillus welchii* infections as in gas gangrene in wounds. The organisms present in several of our cases seem undoubtedly to be

Bacillus welchii. Obviously the correct procedure will be to employ at the earliest possible moment large quantities of this antitoxic serum.

The most pronounced clinical feature in these infections is the apparent lack of realization by the patient herself of the severity of her illness. In contradistinction to the anxious and worried facies of the ordinary general peritonitis patient these patients are calm and unruffled. They seem to be mentally numbed, although quite clear and intelligent.

Case I.—*Bacillus Welchii* Infection of the Uterus and Liver.

(Under the care of Dr. R. Magarey.)

Clinical History.

K.M., a woman, aged twenty-eight, married for seven years, was admitted to the Adelaide Hospital on June 7, 1926. Her illness had commenced on the evening of June 5, when she complained of severe pain in the lower part of her abdomen. Next morning she began to bleed *per vaginam* and the afterbirth came away. She lost a large amount of blood. Early in the morning of June 7 she became yellow all over and at frequent intervals vomited a considerable quantity of green fluid and complained of severe abdominal pain. On examination her temperature was 36.1° C. (97° F.), the pulse rate was 120 and regular, but it was soft with poor volume. Her systolic blood pressure was 75 millimetres of mercury and the diastolic pressure was 60 millimetres. The respirations numbered 36 in the minute. Her pupils were equal and reacted equally to light and accommodation. The sclerotics were deeply jaundiced. Her tongue was very dry with a white fur on the dorsum. Nothing abnormal was detected in the heart or lungs. There were no signs of physiological activity in her breasts. The whole of her skin was deeply jaundiced. Her abdomen moved with respiration. It was tender all over, more so over the lower half. The liver dulness extended from the sixth intercostal space to the costal margin. The liver edge was not palpable. The fundus of the uterus could be palpated in the suprapubic region. On examination *per vaginam*, the patient was bleeding freely. The cervix pointed downwards and backwards. The lips were softened and the os patulous admitting one finger. The body of the uterus was enlarged and anteverted and ante flexed. Blood clot and placental remains could be felt in the cervix. Much was extracted digitally. There was nothing abnormal detected in either fornix. Her urine was acid, of specific gravity 1028, with much bile present; there was no albumin, blood, pus or sugar. She was too ill to have a general anaesthetic so an attempt was made to empty the uterus without one. A small amount of foul-smelling, decomposing placental remains were scraped away. She was given glucose and saline *per rectum* and plenty of fluids. At 2.10 a.m. on June 8 she died.

Post Mortem Findings.

The body was that of a young woman intensely jaundiced and of an orange-yellow colour. Gas escaped on making an incision through a vein near the top of the sternum. An inflammable gas, burning like a bunsen burner with a pale flame, escaped on snicking the peritoneal cavity. This required three blows to put it out. There were several ounces of bloodstained, thick fluid in front and behind the uterus. The uterus was just above the brim of the pelvis. At the fundus posteriorly and to one side was a soft, ragged area the size of a shilling through which a catheter easily slipped into the interior. On removal there were several areas near the fundus, especially posteriorly, from the size of sixpence to that of a two shilling piece, which were soft, "saggy" and hæmorrhagic. On section the necrotic patches in the uterine wall were found to be soft and disintegrated. The uterine wall at the fundus was very thin. The interior of the uterus was filled with soft, red necrotic-looking tissue. The cervix was lacerated, soft and hæmorrhagic. The Fallopian tubes and ovaries were normal. The lungs were somewhat congested and bile-stained. Gas escaped on opening the chambers of the heart. There were no obvious necrosed patches in the heart muscle. The liver weighed 1,815 grammes (sixty

and a half ounces); it gave a slight crepitan feeling and was yellowish-stone in colour; its architecture was indistinct; the cut surface showed an early foamy appearance. The bile was dark-coloured and very viscid. The spleen was large and dark red in colour, but of normal texture.

Microscopical examination of the liver revealed only occasional small necrotic foci from which the nuclei had disappeared. These were teeming with large bacilli. One section manifested none of these changes. The spleen contained very small necrotic foci with bacterial masses in their centres. The heart muscle appeared normal. Some granularity of the cells of the tubules and occasional casts were found in the kidneys.

Films stained by Gram's method contained very numerous large Gram-positive rods in the liver, some large bacilli of the same type in the spleen and in the uterine contents the same large Gram-positive bacilli with many other bacteria. Inoculation of cooked meat media gave abundant gas formation; large Gram-positive bacilli together with other organisms were obtained from cultures from the three organs mentioned. In subcultures the large Gram-positive organisms conformed in morphology with *Bacillus welchii* and gave rise to a typical stormy clot in milk.

Case II.—*Bacillus Welchii* Bacteriæmia of Puerperal Origin.

(Under the care of Dr. R. Magarey.)

Clinical History.

Mrs. E. P., aged twenty-four, married for one year, was admitted on July 6, 1926, complaining of severe pain in the lower part of her abdomen and across her back. Her illness had begun at 2 p.m. the previous day with a shivering attack. This was followed by severe pain in her abdomen and then she began to lose blood *per vaginam*. She had vomited several times. She said she was two months pregnant. She had not had any children or any previous miscarriages. She denied any interference with pregnancy. On admission her temperature was 37.9° C. (100.2° F.), the pulse rate was 128, the pulse was regular but of poor volume and the respirations numbered 48 in the minute. Her pupils were equal and reacted equally to light and accommodation. The sclerotics were jaundiced; her tongue was heavily coated with a white fur; her nose, cheeks and lips were a deep reddish-blue colour; her ears were of a natural colour. Her finger nails were blue, while her toenails were natural in colour. Nothing abnormal was detected in her heart. The systolic blood pressure was 98 millimetres of mercury and the diastolic pressure 70 millimetres. There were crepitations at both bases, but otherwise her lungs were normal. No signs of physiological activity were detected in her breasts. Her whole skin was coloured with an icteric tinge. Her abdomen moved slightly with respiration and the liver dulness extended from the sixth rib in the mid-clavicular line to the costal margin. Neither kidneys nor spleen were palpable. The patient was very tender to palpation over the lower part of the abdomen, but more so in the right ileo-pelvic region. Her knee jerks were equal and active and her plantar reflexes were flexor in type. Vaginal examination revealed that she was losing a great deal of blood and clots which had an offensive smell. There was no urethral discharge. Her cervix was softened and the os patulous, admitting one finger. The cervix pointed downwards and backwards and moved freely. The uterine body was in the anterior position. It was enlarged and softened. She was tender in both right and left fornices, more so in the right fornix. Her urine was acid, of specific gravity 1028 and very dark, blackish-brown in colour. Albumin was present and it reacted to the chemical tests for bile and blood. There was no pus. Four hours after admission the patient was given ten cubic centimetres of anti-bacillus-welchii serum intravenously and eight hours after admission her temperature rose to 38.9° C. (102° F.) and the pulse to 132, the respirations remaining the same. From 9 p.m. until 2 a.m. (evening of admission) she was given forty cubic centimetres of anti-bacillus-welchii serum intravenously in ten cubic centimetre doses

approximately every hour. Her condition improved slightly and at 3 a.m. her temperature was 37.6° C. (99.8° F.), the pulse rate was 114 and the respiratory rate 36. She was then placed in an incomplete Fowler's position and was given copious alkaline fluids per mouth and *per rectum* and fomentos were applied to her abdomen. She vomited at frequent intervals and coughed up some bloodstained sputum and was still voiding black-coloured urine. In the morning following her admission her condition seemed a little improved, except that she was somewhat drowsy. Her temperature then was 37.8° C. (100° F.), her pulse rate was 124 and respiratory rate 40. From then onwards she gradually lapsed into unconsciousness and at 12 noon on July 8 she died.

Examination of blood taken soon after admission revealed 1,700,000 red cells to the cubic millimetre, 77,300 white cells, a hæmoglobin value of 50% and a colour index of 1.2. The red cells manifested anisocytosis, pallor and polychromatophilia. There were many normoblasts present and an occasional megaloblast. The vast majority of the white cells were represented by polymorphonuclear leucocytes, many being young forms and an occasional myelocyte was seen. An anaerobic culture from the blood, taken at the same time, in meat medium, contained large Gram-positive gas-producing bacilli, *Bacillus welchii*. Aerobic and broth cultures contained the same bacillus after two days' incubation. Her urine contained many epithelial cells, blood pigment casts, many short Gram-negative bacilli and Gram-positive diplococci. Gram-negative bacilli and a few Gram-positive cocci were grown in the cultures. A smear made from the uterine scraping contained many epithelial cells, blood and some pus cells and numerous Gram-positive bacilli. The aerobic cultures contained short Gram-negative bacilli and a few Gram-positive bacilli. Anaerobic cultures (meat medium) contained Gram-positive bacilli and streptococci. Material obtained by liver puncture immediately on death showed *Bacillus welchii* in smears and cultures.

Post Mortem Findings.

Post mortem examination was commenced within five hours of death. The body was that of a well nourished woman with the nose deep blue in colour and with frothy fluid exuding from the nostrils. An inflammable gas burning with a bluish flame, escaped on opening the abdominal cavity. The abdomen contained some blood-stained turbid fluid, perhaps as the result of the liver puncture performed immediately after death. The uterus contained in its interior some rather soft reddish material which could be separated cleanly from the underlying surface. There was no obvious sign of gross infection of the uterus. The lungs manifested considerable congestion and bubbles of gas escaped on section. The blood in the heart was frothy. The liver was pale and putty coloured and had a minute, foamy appearance. It weighed 1,710 grammes (fifty-seven ounces). The gall bladder was full of gas and thick greenish bile. The spleen was a little enlarged, firm and dark red and weighed 195 grammes (six and a half ounces). The stomach, duodenum, intestines and suprarenal glands appeared normal. The kidneys, weighing 285 and 225 grammes (nine and a half and seven and a half ounces) respectively, were considerably enlarged and were swollen and dark, purplish-red in colour.

Microscopical examination revealed the following. There were no special changes in the wall of the uterus, but its contents manifested collections of polymorphonuclear cells, fibrin, red cells and probably some decidual cells, but bacteria were not evident. The liver contained numerous islands of necrosis with bile impregnation, poor staining *et cetera*; in some of the areas apparently around the central veins there were occasional dense masses of *Bacillus welchii*, sometimes associated with a cavity, probably a gas cavity. The bile capillaries were filled with bile. The liver cells seemed to retain their nuclei very long in the necrosed areas. The spleen contained occasional necrotic foci with groups of large bacilli in the centre and there was considerable blood pigment. Cloudy swelling was found in the kidneys together with granular blood pigment casts, especially in the collecting tubules, the pigment being less obvious and more diffuse in the convoluted tubules.

PARTIAL RUPTURE OF THE UTERUS DURING PREGNANCY WITH FATAL INTRA-PERITONEAL HÆMORRHAGE.

By J. BURTON CLELAND, M.D.,
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ACCORDING to a recent article by Dr. James Riddell in the *Journal of Obstetrics and Gynecology of the British Empire* (Spring Number, 1926) rupture of the pregnant uterus before the onset of labour is exceedingly rare. He divides the cases into three categories:

1. Those in which there is no gross anatomical defect, but in which there is usually a diseased, degenerated or previously injured uterus as the predisposing cause with indirect violence as the exciting cause of the rupture.
2. Cases in which there are gross lesions such as interstitial pregnancy *et cetera*.
3. Traumatic ruptures, that is from wounds, crushing *et cetera*.

He deals only with the first class of case.

The case about to be detailed differs from Riddell's cases in that the rupture of the uterus was only partial, affecting only the serous and outer aspects of the uterine wall. The tear caused fatal hæmorrhage from a subserous vein. The uterus was greatly distended by hydramnios and the placenta was much flattened out and constituted a partial *placenta previa*. There is no evidence that the site of rupture was diseased and since the tear was on the serous coat and did not affect the inner wall, it is unlikely that infection of the uterine mucosa in the earlier pregnancy, if any such infection had taken place, could have played any part in leading to the rupture. It would seem that the uterus was over-distended with the increase of fluid and that its wall was thinned in consequence. Vomiting, probably in sudden attacks and of a forcible nature, was apparently the exciting cause of a partial rupture of the wall which passed through some small veins from which fatal intraperitoneal hæmorrhage occurred. Perhaps the rupture was similar to that when a tense watermelon is struck a violent blow.

In the cases mentioned by Dr. Riddell the patients, as in this case, had usually borne children. The chief predisposing cause was previous injury and infection of the uterus. Slight forms of indirect violence often acted as the exciting cause of rupture. The rupture was usually confined to the upper part of the uterus, whereas the tear in this case was lower down. The diagnosis according to Riddell depends on recognizing the acuteness of the abdominal condition.

Clinical History.

Miss S.T., aged thirty-six years, an unmarried woman who had had a child one year and eleven months previously, was admitted to the Adelaide Hospital under Dr. T. G. Wilson on September 22, 1926, with a history of illness of two days' duration. The patient was six months pregnant. Her illness had commenced suddenly with vomiting followed by a general abdominal pain. Since then she had vomited repeatedly a greenish, bitter fluid. The bowels had been open on the morning of admission. There was no history of injury or interference. The patient was admitted in a collapsed condition with a temperature of 35° C. (95° F.) and a pulse rate of 132. The uterine fundus was palpable 3.7 centimetres (one and a half inches) above the umbilicus and was tender and firm. No movements could be felt and no fetal heart sounds could be heard. No dulness in the flanks was detected on admission. There was a little blood in the vagina. The cervix was soft and dilated, the membranes were not ruptured and the head was presenting. The patient's bladder was catheterized, morphine 0.01 gramme (one-sixth of a grain) was administered and the vagina was plugged. A subcutaneous injection of saline solution was given. The patient died a few hours after admission.

Pathological Report.

On opening the peritoneal cavity at autopsy about nine hundred cubic centimetres (thirty ounces) of fluid blood and about half a litre of clot were found in it. The uterus was enlarged to more than the size of a six and a half months' pregnancy. The blood had apparently escaped from a rent on the posterior aspect of the uterus towards the left side between the attachment of the broad ligament and the middle line. The rent was in the *serosa* extending into and exposing the muscle and was about five centimetres (two inches) long and had some clot attached to it. The rent did not pass completely through the uterine wall. During manipulation the pregnant uterus was thrown forwards and a transverse slit several inches in extent developed on the posterior aspect of the uterus. Evidently the serous and subserous tissues were liable to give way when put upon the stretch. An examination of the area where the original rent occurred revealed the presence of two converging veins from which apparently the hæmorrhage had taken place. On opening the uterus hydramnios was present, there being 2.8 litres (ninety-four ounces) of fluid. The placenta was a partial *placenta previa* attached to the posterior and left lateral wall. It was 22.5 centimetres (nine inches) in diameter and unduly thin. The fetus was a female of about six and a half months. The interior of the uterus showed no evidence of any perforation. The other organs contained no lesions of any moment. Microscopical examination of the uterine wall at the site of rupture revealed no fatty changes in the muscle; there was some blood clot adherent to the torn surface and, as might be expected, a slight increase of leucocytes was found below this.

PURULENT INFILTRATION IN AND AROUND THE THYROID GLAND.¹

By J. BURTON CLELAND, M.D.,
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Adelaide Hospital.

ACUTE suppurative conditions of the thyroid gland are rarely reported. Within a year at the Adelaide Hospital three such cases have come under our personal observation. The histories did not specially suggest any condition affecting the thyroid gland and it was only by carrying out a systematic and routine examination of the tissues of the neck that these lesions were detected. In two of the examples there was a diffuse purulent exudate due to streptococci, but without much oedema and congestion. In the third case a diffuse purulent infiltration of the thyroid gland (quite unsuspected) was part of a pyæmia of puerperal origin due to *Staphylococcus aureus*.

CASE I.—J.C., a male, aged sixty-seven years was admitted under the care of Dr. Hone on April 2, 1926, and died two days later after an illness of ten days' duration. This illness had commenced with a cold after work. His work was on a bitumen tank. He had had loss of sleep and shortness of breath for three or four days and was a wasted, toxic-looking man. He was feverish and had an increased pulse rate. There was swelling of the lower part of the neck. There were no abnormal physical signs in the lungs. He was an alcoholic and had a coarse tremor in his hands. At the autopsy several dirty teeth with exposed roots bathed in pus were found. There were no lesions of moment except in the neighbourhood of the thyroid gland, where there was a diffuse purulent infiltration in the tissues around the thyroid gland and cricoid cartilage and apparently replacing the right lobe of the thyroid itself. The pus which was mixed with stringy necrotic tissue, was circumscribed by the surrounding fascia. The left lobe of the thyroid had a large mass 3.75 centimetres (one and a half inches) by three centimetres (one and a quarter inches) in size, which turned out on section to be neoplastic (? carcinomatous). Smears

¹Read at a meeting of the South Australian Branch of the British Medical Association on March 31, 1927.

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of the pus contained short chains of streptococci and cultures showed that these were hæmolytic. Death was apparently due to toxæmia from the streptococcal infiltration. The organisms may possibly have gained entrance from the teeth-sockets and the presence of a new growth in portion of the thyroid gland may perhaps explain their localization and multiplication in its vicinity. There was little evidence of acute inflammatory reaction and œdema around the purulent focus, suggesting that the patient's tissues were reacting very poorly against the streptococcal invasion. The spleen was dark red and a little soft and weighed one hundred and eleven grammes (three and three-quarter ounces).

CASE II.—R.W., a male, aged fifty years, was admitted under the care of Dr. Ray on December 12, 1926, and died two days later. He had been ill for only five days, the illness having commenced with swelling and redness of the right great toe followed by swelling of both wrists, the left elbow and the left knee. His voice had become hoarse. He was thought to have signs of bronchopneumonia.

Autopsy revealed a purulent arthritis of the proximal joint of the right great toe with some erosion and redness of the joint surfaces. In and around the small extrinsic muscles of the larynx and occupying the fascial planes, was a diffuse purulent infiltration becoming thicker in front of the upper part of the trachea. It was present above the upper border of the thyroid gland and infiltrated its left lobe in places, especially along the septa and on the deeper aspect. It was present in considerable quantity between the thyroid lobe and the subjacent cartilage. The exudate presented a pale yellowish-white necrotic appearance. There was no special œdema or congestion around. The pharynx and larynx were unaffected. The lungs were merely œdematous and congested. Streptococci were present in smears of the pus from the great toe and from the neck. Streptococci were grown belonging to the *viridans* type. The spleen was slightly large, softer than normal and weighed 187 grammes (six and one-quarter ounces).

CASE III.—E.K., a woman, aged twenty-five years, was admitted under the care of Dr. W. A. Verco on December 25, 1926, and died three days later. Four days before admission she had given birth to a full-time child. On the day of admission she had had rigors, abdominal pain and a high temperature.

Autopsy revealed infected tears of the vagina and cervix and a greyish-green exudate in the uterus and pyæmic foci in the lungs and kidneys. An area in the sigmoid flexure about twenty-five centimetres (ten inches) long contained a number of miliary abscesses surrounded by inflammatory rings, apparently embolic in origin. There was a diffuse purulent infiltration of the thyroid gland which was swollen and mottled with hæmorrhagic spots and exuded a thick purulent fluid when incised. The spleen was twice its normal size, dark red and weighed 285 grammes (nine and a half ounces). *Staphylococcus aureus* was grown from the thyroid gland and uterus.

Reviews.

FRACTURES.

It is presumed that "The Treatment of Fractures" by Charles Locke Scudder is a work with which all surgeons are familiar.¹ Its virtues are supreme and adequate praise would appear fulsome and possibly criticism would seem impertinent. This work has always been good and to speak in the language of the motor car enthusiast, "this year's model is better than any previous one."

Nevertheless we venture to admit that in all our admiration there does appear here and there a spike of adverse comment. We think that in dealing with head injuries

not sufficient prominence is given to the importance of careful consideration of the state of the blood pressure. It is mentioned, of course, but in regard to the diagnosis of cerebral injury from cerebral compression pure and simple it is not brought out in its true perspective. Such comments could possibly be multiplied, but they are small points.

Special subjects have been prepared by certain men chosen because of interest, training and experience and we find among the contributors such names as those of Joseph C. Bloodgood, Frederick W. Bancroft, Kent H. Thoma, Edward D. Truesdell and others.

Every consideration is given to the important subject of extension and the seeker for information on this point will find nothing omitted. We are glad to see some prominence given to the work of Major Sinclair in this field.

Most surgeons will find the discussion on the pathology of Volkman-Leser contraction interesting. The problem is considered in some detail and the conclusion arrived at is that it is due to interference with the venous return. This conclusion is based to a great extent on the work of Brooks (*Archives of Surgery*, Volume V, 1922). All this yet again emphasizes the necessity for frequent reviewing of fractures.

The surgery of the complications is admirable in detail and rationalism. The question is weighed and considered in a judicious manner and no hasty conclusions are arrived at. Particularly does this apply to the musculo-spiral and ulnar nerves.

Most ingenious are the appliances recommended for fractures of the metacarpus and digits and the reader will be lost in admiration at the wealth of detail.

It is questionable whether the remark, "We can apply as efficient treatment to the fractured hip in the aged as in the young adult," will pass without challenge. Some will still feel that in efficiently treating the fracture they may lose the patient. Still, coming from such an authority due weight must be given to the statement.

A word must be said of the excellence of the advice and the emphasis laid upon after treatment in all fractures. This is a matter that is too often but shallowly considered. There is a wealth of detail and thoroughness also in the surgical treatment of fractures. Nothing would seem to be omitted. The illustrations and anatomical charts are very helpful.

The very important question of massage and movement is discussed in a rational and sound manner.

What is the difference between non-union and delayed union of bones? Scudder would seem to indicate that where the radiogram shows no sign of bone proliferation a condition of non-union exists, no matter how soon after a reasonable time has elapsed. If, on the other hand, there is proliferation, the condition is one of delayed union, no matter how long after the accident. We have seen fractures as long as two years (and more) still ununited and yet the radiogram reveals good bone activity. Are such conditions merely examples of delayed union? If so, how long are they to be so regarded and when do they merge into genuine non-union?

There is a good chapter on pathological fractures by Joseph Colt Bloodgood, but it seems strange to see so small a point made of the incidence of hydatid. It is merely mentioned in a summary.

The important subject of injuries to the epiphyses is well and exhaustively handled and should prove of unusual assistance, as it contains with other material, a chapter dealing with important anatomical facts regarding the epiphyses.

It may fall to the lot of any medical practitioner to have to take charge of a child with a birth fracture and if he has not had much previous experience in this important branch of reparative surgery, reference to the work under review will be an enormous help.

To summarize it may be conservatively stated that the work is exhaustive, accurate and profusely supplied with illustrations that are helpful. Of this book it may truly be said that it should find a place on a shelf of any surgeon's bookcase. We congratulate all those who have been associated with its production.

¹ "The Treatment of Fractures with Notes upon a Few Common Dislocations," by Charles Locke Scudder, A.B., Ph.B., M.D., F.A.C.S.; Tenth Edition, Revised; 1926. Philadelphia: W. B. Saunders, Company; Melbourne: James Little, Royal 8vo., pp. 1240, with illustrations. Price: £3 net.

SYPHILIS AND IMMUNITY.

"IMMUNITY IN SYPHILIS" by Dr. Alan Chesney, of the Johns Hopkins Medical School, is the twelfth of a series of medical monographs which originally appeared in *Medicine*, a quarterly periodical of Harvard Medical School and the Johns Hopkins Hospital.¹

This monograph is in essence a review of the present day knowledge concerning this vital aspect of syphilology.

A critical review of all the experimental work done in recent years towards an elucidation of this problem is presented to the reader in an unbiased manner. Evidence is weighed carefully; pros and cons as regards conclusions drawn from experiments are considered and balanced opinions are finally supported throughout the work. The author's survey has been wide and comprehensive, for he refers the reader to a bibliography of over one hundred and sixty papers.

In the first half of his book he enumerates and discusses the experiments carried out on man, monkeys and rabbits with the object of determining the nature and extent of acquired resistance to a second infection of syphilis both with heterologous and homologous strains of treponemes. He gives ample reasons for disagreement with Neisser who claimed that a second infection was not possible when foci of the first syphilitic infection persisted and hence he disposes of the reinoculation test as a criterion of cure.

In the second half of the book there follows a brief description of the various experiments dealing with active and passive immunity in syphilis and those demonstrating the presence of specific antibodies. The reader is informed that extracts of syphilitic tissue, cultures of treponemes, syphilitic virus and transfer of serum from immune persons have all been uniformly unsuccessful in producing even a comparative curative effect.

Finally the author discusses the mechanism of immunity in syphilis and in doing so he elaborates some clever hypotheses concerning the interaction between invading treponeme and host.

FACTS ABOUT ENZYMES.

WAKSMAN and DAVISON in their recent monograph on the enzymes have surmounted a task of considerable magnitude in compressing into a single volume of less than four hundred pages the salient facts concerning the properties of enzymes, their distribution, methods of preparation and application in the arts and manufactures.² The book is written from the practical standpoint and conveniently groups together a number of data which are not elsewhere readily accessible.

There is a bibliography of over thirteen hundred references. The work should prove a most useful addition to the armamentarium of laboratory workers in plant and animal physiology.

The authors are to be congratulated on having prepared a clear and comprehensive review of the extensive and often conflicting literature of the subject.

THE TAKING OF CLINICAL RECORDS.

DR. JAMES A. CORSCADEN in his manual "History Taking and Recording" insists on the value of thorough history taking in the investigation of disease.³ In his introduction he states that the book is intended for the clinical novice and the work should be of value to students who are acquiring the routine methods of clinical investigation.

¹ "Medicine Monographs: Volume XII: Immunity in Syphilis," by Alan M. Chesney; 1927. Baltimore: The Williams and Wilkins Company. Royal 8vo., pp. 94. Price: \$2.50 net.

² "Enzymes: Properties, Distribution, Methods and Applications," by Selman A. Waksman, M.S., Ph.D., and Wilburt C. Davison, M.A., M.D.; 1926. Baltimore: The Williams and Wilkins Company. Royal 8vo., pp. 376. Price: \$5.50 net.

³ "History Taking and Recording," by James A. Corscaden, M.D.; 1926. Paul B. Hoeber, Incorporated. Post 8vo., pp. 84. Price: \$1.50 net.

INTESTINAL CONDITIONS AND THEIR TREATMENT.

It may be said at once that "Diseases of the Intestines," by A. P. Cawadiaz, is well worth reading for it contains much of interest and value, even though there is also much with which many readers will not agree.⁴

In the description of the various diseases of the intestines, a system which differs from that usually employed, is used and in the preface the various terms used are defined and the reasons for using them are stated. Though different names are employed, the essential features of the descriptions do not as a rule differ much from those found in other books. Exceptions are found in the original ideas which are frequently introduced. General acceptance of some at least of these seems doubtful.

Some new words are also introduced. In one place it is said that a term is needed to signify diminution of resistance and a word is supplied. This word is mianosis, but the necessity for providing it seems doubtful. Another example is found later in the book where a clumsy composite word, centropigastric, is suggested for the point of tenderness "in the middle of a line uniting the end of the sternum to the umbilicus."

In the section on muco-membranous colitis another name is suggested. This is spasmodico-myorrhœic syndrome. The views expressed regarding its causation are interesting, but more details of its treatment would be valuable, especially as the impression is given that its treatment is not difficult.

Treatment in other parts of the book is also given in insufficient detail. Important complications of conditions which are otherwise considered fully, are omitted.

Some obvious errors have crept into the text. An example is seen in the confusion of *Amœba coli* with *Entamoeba histolytica*. The text is marred by numerous misprints of which two occur in the heading of a chapter.

A BOOK FOR PROSPECTIVE MOTHERS.

"MOTHER AND UNBORN CHILD," by Samuel Raynor Meaker, a book intended for the use of prospective mothers, should prove a valuable asset to the campaign for the improvement of obstetrical conditions.⁵

A well written and well produced volume, it is pleasantly free from excess of sentimentality. This book is straightforward and clearly arranged and offers a wide range of information suitable to women of intelligence without being dogmatic. Its tone is cheerful and wholesome and it disproves pernicious myths which still cling to the process of childbearing.

The book contains twelve chapters, including a clear and simple description of the anatomy and physiology of reproduction, an outline of the prenatal development of the child, an explanation of the signs and symptoms of pregnancy and a common sense guide to the hygiene of the pregnant and nursing mother. It urges antenatal supervision, deals clearly and simply with the process of labour and finishes with a short description of the care of the infant.

In reading this book the average intelligent woman will find all the information she needs and she will not find more than it is suitable for her to know.

Professor Meaker makes a few statements which are still open to controversy and his advice is written with a view to the customs and climate of the United States and is, therefore, in part not applicable to conditions surrounding Australian women. The list of articles he considers it necessary to provide for the confinement seems unduly excessive and would be beyond the means of the majority of women.

These points, however, in no way detract from the value of a book which every prospective mother should be encouraged to read. Professor Meaker should be congratulated and thanked for its production.

⁴ "Diseases of the Intestines," by A. P. Cawadiaz, O.B.E., M.D. (Paris), M.R.C.P. (London); 1927. London: Baillière, Tindall and Cox. Demy 8vo., pp. 314, with illustrations. Price: 16s. net.

⁵ "Mother and Unborn Child: A Little Book of Information and Advice for the Prospective Mother," by Samuel Raynor Meaker; 1927. Baltimore: The Williams and Wilkins Company. Demy 8vo., pp. 218. Price: \$2.50 net.

The Medical Journal of Australia

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The Hospital Policy.

IN 1924 the Representative Body adopted certain resolutions affecting the policy of the British Medical Association in Great Britain concerning the relations of the medical profession to public hospitals. These resolutions were the outcome of much discussion and prolonged consideration of the whole subject of hospital administration and management on the part of the special committee appointed by the Representative Body for the purpose. They represented the opinion of a considerable majority, but the opposing minority fought hard until the end to maintain the previously existing policy. It was evident to all impartial observers that the reversal of policy was both logical and inevitable. The public hospital has passed through various stages of evolution and further changes must follow. Originally hospitals were religious institutions for the succour of the destitute and homeless in time of urgent need. The first change was to restrict the use of the institution to those suffering from illness or accident. The word hospital was retained, although its purpose was no longer the protection of guests. In France the term *l'hôtel Dieu* is still in use. The patients in this stage of hospital evolution were indigent or those who were homeless. Sailors or rather seamen were always admitted. Later the general public began to interest itself in the welfare of the poor and especially of the poor during incapacity caused by illness and the maintenance of the majority of hospitals was a matter of charitable contribution. With the development of scientific medicine certain large hospitals were used for the training of students. Those who could afford to engage the services of a private doctor, scorned to enter the doors of the hospital, for it was recognized that it was a purely charitable institution maintained by the purse of the rich for the poor. Many poor people objected to the price imposed for the treatment, namely the

submission to the presence of a crowd of medical students. In the following stage the State realized its responsibility in regard to certain dangers to the community. The insane and those suffering from epidemic disease had to be controlled as well as treated and for the time being the patients were necessarily deprived of their freedom. The Poor Law imposed on the local authority the obligation to provide for the destitute. Old people without means, persons suffering from incurable chronic diseases, and the unemployable found asylum in the so-called workhouses, while as time progressed large hospitals, called poor law infirmaries, came into being. Later the advances in medical science and in surgical art rendered the treatment of the ill and of the injured increasingly costly. The phase of hospital abuse resulted as a natural consequence. At first well-to-do people used devious means to gain admission into the large voluntary public hospitals, because it was evident that modern treatment was out of their reach elsewhere. Only the rich could afford to pay for all that was given gratuitously in hospitals. Little by little the large middle class shook off its diffidence in claiming the right to use the great public institutions. To meet this growing encroachment on the funds, the hospital authorities adopted the expedient of charging patients for their maintenance either in full or in part. Employers of labour entered into arrangements with the hospital administration for the admission of the employees during illness or for injuries caused by accident and a fixed contribution was paid for this privilege. In 1923 the British Medical Association objected to the contributory schemes by employers of labour or by employees if regarded as the basis of a contract to insure against the cost of maintenance in hospital and treatment. It was suggested that these contributions should be regarded as charitable gifts, but the attitude was untenable. The hospital authorities accepted the payments as premiums for insurance against the cost of maintenance and treatment.

In Australia the great public hospitals are to a large extent State supported. The report of the sub-committee of the Federal Committee reveals that the administration, management and organization of the various hospitals vary widely in the several

States. The subcommittee has endeavoured to set up a new classification in order to formulate a hospital policy for the medical profession. Some of the best points in the Victorian scheme are advocated, while the lead given by Mr. R. J. Love, Inspector of Hospitals and Charities of Victoria, is followed to some extent. If hospitals could be classified as well as standardized, it would be a relatively easy matter to devise a policy for the medical profession. The subcommittee points out that one class of hospital known by the American name of community does not exist in any State of Australia. Intermediate hospitals are said to exist only in Victoria. It appears therefore that until the conditions governing the admission of patients to public, State and private hospitals are defined on a uniform plan, it would be hazardous to attempt to set up any elaborate policy which would commit the medical profession in matters of detail. The Federal Committee has avoided such a step. It has kept the door open and had merely enunciated a general principle to be applied to public hospitals. Honorary medical officers to public hospitals are to give gratuitous treatment to all persons who do not pay, but they should receive payment for their services to those who are required to pay for their maintenance and treatment. It will be noticed that the payment by the patient must be for medical treatment as well as for maintenance. If the hospital charges only for the latter, the medical officer is not entitled to any remuneration for his services. Sooner or later it will become necessary for the medical profession to enter into a definite arrangement with the hospital authorities in this regard. Honorary service should be given in future as in the past to persons who cannot afford to pay. But if the board of management collect money from patients, it must be recognized that the doctor has the same right as the institution to receive part. The Federal Committee has been wise in exercising caution in regard to its reversal of policy. While it is essential to protect the profession against exploitation, it is just as essential to devise means whereby hospital physicians and surgeons will be prevented from taking undue advantage of their positions.

Current Comment.

CAPILLARY PERMEABILITY.

THE protoplasm of a living cell may be looked on as a colloidal solution of protein. It consists of a suspension of molecules built up of loosely combined amino acids and radicles. When the particles are dispersed evenly throughout the fluid the viscosity of the protoplasmic mass resembles a solution and it is known as a sol. If the particles become crowded together, the viscosity is that of a jelly and the mass is known as a gel. The state of the mass is continually changing in response to physico-chemical stimuli originating in the surrounding medium. Electrolytic action produces effects not only in the cell itself but also on the cell membrane. It determines the degree of dispersion of the particles suspended in the protoplasmic mass and it produces variations in the surface charge and surface tension of the cell.

If consideration be given to the permeability of endothelial cells lining the capillaries, it is evident that the factors concerned are complicated. The hydrogen ion concentration of the blood is of the utmost importance and is concerned with the phenomena already mentioned. At the same time nervous stimuli produce effects on the cells of the capillary walls. These factors have recently been discussed by William F. Petersen and David A. Willis¹ and their findings in regard to permeability have been applied to clinical conditions by Petersen and George Milles and A. F. Lash.² They have endeavoured to determine the capillary permeability and the inflammatory index of the skin in normal persons by means of a cantharides blister. They conclude from the work of Lillis, Osterhaut, Embden and Gildermeister that the cell can respond to an alteration of external conditions in one of two ways. The cell membrane may become more permeable (this modification is stimulation) or it may become less permeable (in specialized cells this is a refractory period and in a general sense it is a period of rest). When the cell membrane is more permeable, it will have enhanced oxidation, increased excretion of lactic acid, phosphate and calcium, it will take up more potassium, the surface charge will be lessened, the surface tension reduced, the cell turgor lessened and amœboid movement and phagocytosis will be enhanced. When the cell membrane becomes less permeable, it will contain more calcium and less potassium, it will have a higher surface potential with greater surface tension, greater turgor and less amœboid movement. These statements are made gratuitously without any attempt to prove their truth. While the alteration in permeability is largely due to environmental changes of the surrounding tissues, it may be of hormonal and in some instances of autonomic origin. At the same time many of the autonomic agents also act directly on the endothelial cell itself and not through the neuro-cellular junction.

As far as Petersen and Willis can discover, the only previous worker to use the blister for a pur-

¹ *Archives of Internal Medicine*, November 15, 1926.

² *Ibidem*, December 15, 1926, January 15, 1927.

pose similar to that of their research, is Gänsslen. Gänsslen noted the length of time required for a blister to draw and called it the blister time. Normally this was about twelve hours. Shortening was noted in the vascular neuroses, in exophthalmic goitre and in critical conditions associated with a hæmorrhagic diathesis. Gänsslen found that it was immaterial by what means the blister was produced and regarded cantharides plaster as the most useful. It is obvious that this applies only to blisters formed by chemical agents and not to blisters due to trauma. Petersen and Willis point out that cantharides being a soluble lipid, it enters the skin readily and probably produces its effect in two ways, on the sensory nerve ending and directly on the capillary wall. They evacuated the fluid from a blister as soon as it had formed and also took a sample of blood from the lobe of an ear. The two samples were examined by a refractometer and their protein content was determined. The ratio of percentage of blister protein to percentage of serum protein was taken as the permeability ratio. The inflammatory index was determined by use of the coefficient $\frac{\text{permeability ratio}}{\text{blister time}}$. The index of

permeability indicates the actual degree of response of the capillary endothelium to a direct stimulus. The inflammatory index, on the other hand, includes the effect of the autonomic tonus.

The findings of Petersen and his collaborators in regard to normal individuals, menstruation and various pathological conditions are given in considerable detail in four articles. The capillary permeability was found to vary inversely with the blistering time. Diminished capillary permeability was found to be associated with increased blood pressure. On the other hand when the inflammatory index was used, there was no evident relationship between the blood pressure and the degree of reaction. It will be seen at once that this opens up important questions in connexion with arterial hypertension. Krogh and Hooker found that the capillaries can dilate independently of the arterioles and if the work and the conclusions of Petersen and Willis can be confirmed, it will lead to the inevitable conclusion that increased blood pressure is associated with lessened capillary permeability and not with the increased tonus of the arteriole. Exophthalmic goitre is a condition which is regarded by these workers as having a distinct parasympathetic tonus of the arterioles and it was found that the permeability may vary from high to low. The patients with low permeability are usually those with a high blood pressure. It was also seen that the degree of permeability bears no relationship to the basal metabolic rate. It was found that at the onset of menstruation the capillaries become more permeable and that changes take place in the autonomic innervation of the arterioles whereby the skin region becomes parasympathetic and the visceral area "presumably sympathetic." At the same time it is pointed out that in the premenstrual and menstrual periods the blood pressure average is higher than during the

intermenstrual period. This is at variance with the finding previously mentioned that diminished permeability is associated with increased blood pressure. It was found in various forms of dermatitis that the blistering time was diminished and that the percentage of protein in the blister fluid was increased. Paget's disease of bone and *arthritis deformans* are characterized by increased permeability and the same holds good for post-encephalitic syndrome and obesity.

One of the main conclusions reached by Petersen is that the blister method offers a relatively simple means of obtaining information concerning the constitutional reactivity of the individual. It is obvious, however, that the subject is one of great complexity and it is extremely difficult to assess the part played by any one factor. Moreover, Petersen and his collaborators have ignored several factors of vital importance. The main question is whether they are measuring the permeability of the cell or not. If a colloidal solution is placed on one side of a membrane, the passage of the colloid through the membrane into the fluid on the other side will depend on the size of the molecule. Protein molecules vary in size within wide limits. *In vitro* the membrane is practically inert and its permeability will be varied only by a process of deposition of colloid on its surfaces. On the other hand in the capillaries the membrane is not inert, but is subject to variations of its biophysical condition. When the authors describe "increased" or "diminished" permeability of the cell, the natural conclusion is that the change originates in the cell. They have ignored the other possibility that the size of the protein molecule varies and thus influences its passage through the membrane. There may therefore be a metabolic basis for the variations in the blistering time. Again when a blister forms as a result of trauma, the fluid may collect in consequence of active changes in endothelial cells, but it has to be shown that simple filtration plays no part in the process. In regard to metabolic processes it must be remembered that a great deal of work has been done in connexion with histamine. This is not mentioned by Petersen and his collaborators. Histamine is one of the products resulting from the breaking down of protein and it has been shown to have a profound influence on the capillary circulation. As already mentioned, Krogh and Hooker found that the capillaries can dilate independently of the arterioles and Dale and Richards have shown that histamine causes capillary dilatation accompanied by arteriole constriction. The part played by histamine in shock has often been discussed. At the same time histamine is but one of the substances which must be considered in this connexion. Further, not only the substances in solution, but the hydrogen ion concentration of the fluid has to be considered. The question of the nervous control of the cell complicates matters and relatively little is known at present of the part played by the nervous apparatus in cellular activity. The whole subject is ultimately bound up in the individual cell and its physico-chemical relationships.

Abstracts from Current Medical Literature.

MORBID ANATOMY.

Two Types of Giant Cell in a Fibrosarcoma of the Uterus.

F. B. MALLORY AND F. W. STEWART (*The American Journal of Pathology*, January, 1927) describe a fibrosarcoma of the uterus in which were found numerous giant cells of two different types. There are at least three types of giant cell. The first results from multiple mitosis and occurs most often in rapidly growing tumours, but occasionally under inflammatory conditions. The second is due to the fusion of endothelial leucocytes to accomplish work which single cells are unable to perform. It is found in association with foreign bodies of all sorts such as lime salts, cholesterolin and fatty acid crystals, cornified epithelial cells, sutures and so forth. The third type is formed by enlargement and direct division of nuclei and occurs in various cells under conditions of degeneration as in the epidermis, for example after repeated freezing. In the tumour reported by the authors cells of the first two types were present. The tumour giant cells were regarded as indicating rapid growth and a high degree of malignancy. The foreign body giant cells were regarded as attempting to dissolve the hyaline collagen. The authors think that the attraction exerted by the hyaline collagen was due to a deposit within it of lime salts.

Hodgkin's Disease.

CUNHA MOTA (*Annaes da Faculdade de Medicina de Sao Paulo*, Volume I, 1926) states that the pathogenesis of Hodgkin's disease is still obscure. He considers that the hypothesis that it is a special form of tuberculosis has been disproved and that claims for the discovery of a specific microorganism have not been substantiated. He objects to the names "lympho-granulomatosis" and "malignant granuloma." The lesion is not always confined to the lymphatic tissue, while the varied histology and the distinctive distribution of the lesions do not accord with a neoplastic origin. These two features are, however, easily explained on the basis of a granulomatous process. He proposes the name "Hodgkin's granulomatosis" as definite and free from the above objections. He reports a case of Hodgkin's disease in which the lesions were found both in the mesenteric and peritracheobronchial lymphatic glands, as well as in the trachea, spleen, liver and bone marrow, and he discusses the part played by the reticulo-endothelial system on the formation of the lesions in this condition. The proliferation of the "epithelioid" elements and the fibrosis which appears later, are asserted to be merely two stages of the same phenomenon. The epithelioid cells or rather the endothelial elements in Hodgkin's disease, have the same histiocytic or hemohistioblastic

origin as the cells found in other granulomata, such as tuberculosis, leprosy, sporotrichosis. They should be regarded as hemohistioblasts undergoing tissue differentiation, that is true histiocytes. Through a further process of differentiation they give rise to the fibroblasts from which the fibrosis of the advanced Hodgkin's disease is formed. The greater frequency of Hodgkin's granuloma in regions of the body having lymphadenoid tissue is explained by the fact that these parts possess a reticulo-endothelial apparatus as a basis for their structure. Sternberg's giant cell represents a condition of high proliferative activity on the part of the histiocytes. Eosinophiles, plasma cells and myelocytes are derived from the same histioblasts through their hematopoietic differentiation. He concludes that: (i) Hodgkin's disease should be considered a lesion of the reticulo-endothelial system; (ii) it is characterized first by a hyperplastic proliferation and later by a differentiation of the polyblastic, embryonic cellular elements contained in the reticulo-endothelial apparatus; (iii) this proliferation represents a reactionary process to a pathological stimulus, the nature of which is unknown.

Degenerative Changes in Skeletal Muscle.

BO STENSTRÖM (*Archives of Pathology and Laboratory Medicine*, March, 1927) discusses degenerative changes in the skeletal muscles, particularly in infective diseases. He has made observations on waxy degeneration and fatty degeneration. The skeletal muscles of forty-seven persons who had died from various diseases, were examined. Thirty-one of the patients were adults and sixteen were children. In none was waxy degeneration absent altogether. The greatest changes were found usually in the diaphragm. Unlike Utsumi, the author was unable to find any obvious difference in the changes that occur at different ages. Febrile conditions did not appear to have any influence on either the occurrence or the intensity of the degeneration. The author refers to "an excellent interpretation" of waxy degeneration, given by Wells in 1912. As a result of experimental work Wells came to the conclusion that the changes were brought about by lactic acid formed in the muscles. Bacteria and their toxins cannot by themselves give rise to degeneration, but they are the means of producing lactic acid in the muscle. Production and accumulation of large quantities of lactic acid may also be increased by a defective circulation through the injured muscles. In forty cases examinations with a view to the detection of fatty degeneration were made. In eight instances none were found. The cause of death in three of these was tuberculosis, in three pneumonia, in one sepsis and in one marasmus. In all the remaining cases the muscles had undergone more or less fatty degeneration, the individual fibres generally being filled with fat granules of

fairly small size. One or several apparently unchanged fibres or fibres in which waxy changes only were present, were usually found between those that had undergone fatty degeneration. No distinct relationship was established between special diseases and muscular fatty degeneration, but in cases of tumour the degeneration was frequent, while in sepsis in adults it was constant.

Ossifying Spondylitis.

RALPH STOCKMAN (*Edinburgh Medical Journal*, October, 1926) discusses ossifying spondylitis. He has come to the conclusion that this condition begins as a fibrositis and that this, like fibrositis elsewhere in the body, is occasioned by different infections. Fibrositis is seldom confined to the ligamentous structures of the spinal column. Fibrositis is common, but the ossification of fibrous tissue is rare. Hence ossifying spondylitis is but one aspect of a more general question. The essential pathological change is the formation of new bone in chronically inflamed fibrous tissue, but it is difficult to explain why this is more apt to occur in the spine than in the peripheral joints. When the anterior common ligament becomes ossified, it simply encases the bodies of the vertebrae and is in contact with them in a thin layer of new bone. Some or all of the other spinal ligaments are also transformed into bone and when the ossifying process invades the fibrous structures of the joints, the joint cavity becomes obliterated and the articular arrangement is replaced by continuous bone. The author contrasts this condition with osteoarthritis. The latter is not a fibrous tissue disease, the pathological process is confined to the joints and consists in a peculiar combination of simultaneous bone absorption and bone production resulting in gross deformities of the articular parts of the bones. Bony ankylosis does not take place and the joint cavity is never obliterated, some degree of mobility being always retained. In ossifying spondylitis rarefaction of the bones of the vertebral occurs from partial disuse.

Leptomeningioma of Spinal Cord.

In a recent issue, April 30, 1927, reference was made to work by J. R. Learmonth on leptomeningioma of the spinal cord and to his view that these tumours are epithelial in origin (*The British Journal of Surgery*, January, 1927). In the course of his observations he has described the microscopical appearances of these tumours and has based his description on thirty-one specimens. The cells of a leptomeningioma are generally somewhat flattened, but their shape varies with the general configuration of the tumour. The cells may be spindle-shaped and "palisading" of the nuclei may be seen. In the vicinity of the *dura mater* the cells may manifest an alveolar arrangement. The amount of stroma varies inversely with the cellularity of the growth, to a certain extent with its age and with its

proximity to the *dura mater*. The stroma consists of a network of fibrils of several kinds and this network supports blood vessels with well developed walls. Fibroglia fibrils are produced by the activity of the tumour cells. Collagen fibrils are disposed in a network between the tumour cells and elastic fibrils are most abundant in areas when progressive invasion of the *dura mater* is taking place. At the same time a considerable portion of the stroma is derived from two additional sources. As a result of compression of the tumour cells their cytoplasm becomes condensed and hyaline and is transformed into strands and whorls of fibrous tissue and in the vicinity of the *dura mater* an infiltrating tumour is broken up by strands of adult fibrous tissue which penetrate into its substance for varying distances. These strands are the result of hyperplasia of the dural substance. Whorl formation is a frequent characteristic of leptomeningiomas and whorls may be cellular or fibrous.

MORPHOLOGY.

Hypophysis in the Albino Rat.

W. H. F. ADDISON AND MARY ADAMS (*Anatomical Record*, May, 1926) follow up the earlier work of Hatai (1913) and Jackson (1917) on the hypophysis with the object of making more precise the information concerning the relative weights of the hypophysis in male and female albino rats. They record that the distal glandular part (*pars anterior propria*) in the female averages more than twice the weight of this part in the male. The *pars intermedia* and *pars nervosa* in the female are both slightly heavier than the corresponding parts in the male. The average weight of the entire female hypophysis was found to be nearly twice as great as the average weight of the entire male hypophysis—a result which agrees with the observations of Hatai. The greater weight of the hypophysis in the female albino rat depends mainly (95%) on the greater weight of the *pars anterior propria*. There are individual variations.

Mitochondria.

E. S. HORNUNG (*Australian Journal of Experimental Biology and Medical Science*, September, 1926) records a further series of observations concerning mitochondria of certain protozoa. With dilute solutions of a new dye stuff, the sodium salt of diethyl safroline monocarboxylic acid, prepared from Janus green, the investigator succeeded in staining mitochondria in living paramoecia and in an unidentified heterotrichian infusoria. Several bacteria were tested with the dye, but they did not show a corresponding selective absorption. Observations are recorded on the relation of mitochondria to the process of intracellular digestion. The engulfed food circulates in the protoplasm and mitochondria come into direct contact with it; they adhere to the food and finally

a vacuole is secreted around the food with its adhering mitochondria. The mitochondria slowly dissolve and the food undergoes disintegration. The vacuole slowly decreases in size, thus indicating an absorption of the digested food. It is concluded that the mitochondria which are believed to be of an enzymotic nature, have brought about the digestion of the food.

The Arteries of the Brain of the Orang-utan.

J. L. SHELLSHEAR (*Journal of Anatomy*, January, 1927) formulates the hypothesis that, contrary to former opinion, arteries are laid down with precision; that they are ontogenetically and phylogenetically stable and that their constancy is due in all probability to their nerve supply which is distributed in such a manner as to adopt functional areas. He shows that in the orang the gross distribution of the cortical vessels almost as accurately indicates the functional regions of the cerebrum as is done in the methods of Elliot Smith and Brodman. The subject is dealt with under two heads: (i) the gross anatomy of the blood vessels of the brain of the orang-utan and (ii) the interpretation of variation and the relationship between blood vascular distribution and functional system. He concludes that the arteries of the brain are developed first segmentally, then intersegmentally and suprasedgmentally. The segmental arteries are functional in their distribution, the main somatic segmental artery being the artery of the reflex arc. The intersegmental and suprasedgmental arteries arise in response to intersegmental, suprasedgmental and commissural demand. The arteries are phylogenetically and ontogenetically stable. The intersegmental arteries are formed by anastomoses between segmental arterial stems of equal functional value; so that the direction of the circulation is in the direction of differentiation of function. Variations of arteries are all explainable by the choice of stem artery which is used to form the commencement of intersegmental arteries. The intersegmental arteries are thus variable to that extent; the final distribution is constant. Areas of equal functional value tend to be joined by arterial anastomoses; areas of different functional value are joined by capillary anastomoses. The arteries of the body are distributed to definite functional areas. The hypothesis is put forward that this is brought about by the fact that they arise in common with the sympathetic nerve elements which supply them, and that they are therefore distributed to respond more readily to nervous stimuli.

The Blood Supply to the Peripheral Nerves of the Superior Extremity.

RONALD RAMAGE (*Journal of Anatomy*, January, 1927) has tried to determine the nature of the blood supply to the nerves of the arm, both extra-neural and intraneural, to find if this is at all constant and whether it throws any light on the clinical facts

relating to nerve injuries and disease especially on the survival of nerve trunks which have been freed for operative purposes over a considerable length and so deprived of the blood vessels going to them. The obvious conclusion is that the blood supply to the nerves is inconstant and never comes from only one artery, but always from multiple sources. It is a rule that each branch divides when near the nerve and sends one branch in a proximal and one in a distal direction. But there are a few exceptions to this rule. The author notes differences between the upper arm and the forearm in the arteries to the nerves. The average number of branches is greater in the forearm, but the branches are also smaller. It is less common to find the vessels running on the surface of the nerve in the forearm, but this may be simply a consequence of their volume. The blood supply is actually better in the upper arm than in the forearm. The musculo-spiral nerve differs from the median and ulnar in having a larger number of branches and microscopical sections of injected nerves indicate that it has a greater blood supply. The vessels of the posterior interosseous nerve are exceedingly fine and the author suggests that this may be the reason why the muscles supplied by this nerve are paralysed in lead poisoning. The *supinator longus* being supplied by the musculo-spiral nerve would escape. In radiographs of injected nerves a continuous chain of vessels can be seen along the whole length of the nerves and the finer vessels anastomose more freely. There is in this quite sufficient evidence to show why nerve trunks can survive after being stripped over a considerable length.

The Development of the Duodenum.

R. H. HUNTER (*Journal of Anatomy*, January, 1927) gives a review of literature on the development of the duodenum and describes his researches from which he arrives at the following conclusions. The duodenum from the developmental point of view is not simply a part of the small intestine, but is developed separately and is liable to variations without involvement of other parts of the intestine. The duodenum owes its adult position to three factors acting on the developing gut segment: (i) A series of differential growth changes which lead to the formation of two loops in the primitive straight duodenum, (ii) the position of these loops governed by changes which take place in neighbouring organs and which force the tube to take the form shown in the various stages, (iii) the disappearance of the mesentery after the colon and duodenum have assumed their adult relations to the posterior abdominal wall. The duodenum and the colon adhere by a fusion of their peritoneal coats at the point where they cross. The pancreas, far from influencing the form of the duodenal loop, seems to grow along the planes of least resistance and to be moulded by the neighbouring organs rather than to mould them.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, on April 28, 1927, Dr. R. J. MILLARD, C.B.E., C.M.G., in the chair.

Welcome to Professor W. S. Dawson.

DR. R. J. MILLARD extended a welcome on behalf of the Branch to Professor W. S. Dawson, Professor of Psychiatry in the University of Sydney, on his arrival from the Old Country.

Epilepsy in Childhood.

DR. A. W. CAMPBELL read a paper entitled: "The Epilepsies of Childhood" (see page 774).

DR. R. A. NOBLE read a paper on behalf of Dr. Guy P. U. Prior who was unable to be present. The paper was entitled: "Epilepsy in Childhood" (see page 775).

PROFESSOR W. S. DAWSON wished to thank the Chairman for his welcome and for his invitation to speak for which he had come wholly unprepared. He had been very interested in the two papers and in particular in regard to Dr. Campbell's finding of the frequency of a history of epileptic heredity. Recent work had pointed to an hereditary factor in one-third of epileptic cases. He also referred to the question of protein sensitivity. It had been found that in a series of sixty-six epileptic patients one or two had reacted to protein. In these two patients no change had resulted when the offending proteins were omitted from their diet. His experience with pyknolepsy was confined to one case. The patient was a girl of eight or nine years of age. She had suffered from what her mother described as "turns"—*petit mal* attacks without convulsions. These attacks had numbered forty or fifty a day and had occurred in batches of several attacks during an hour. Professor Dawson had put the patient on small doses of "Luminal" and the patient had had no attacks for two years. He thought that the prognosis in pyknolepsy seemed to be good and that too much credit should not be given to the "Luminal." In discussing infantile convulsions Professor Dawson said that Thom, of Boston, had made a special investigation of the subject in regard to prognosis, he had been able to follow many of the children to the age of puberty and had found that the prognosis was good. He had not been able to follow them to adult life and could not say what happened to the patients then.

PROFESSOR A. E. MILLS said that he had been specially interested in Dr. Campbell's view that the convulsions of infants were epileptic in nature. He thought that Dr. Campbell was right; but the most important question to him was not the varieties of epilepsy, but what was the actual cause of the epileptic attacks. Until they had some idea as to the cause they would still be groping in the dark and treatment would be utterly empirical. A few years ago Mr. Percy Sargent had given a most interesting address on the causation of epileptic seizures and he put forward the view, which was supported by considerable evidence, that the epileptic seizure was due to vascular disturbance of the brain. Since then he, the speaker, had given considerable attention to this aspect of the question and the more he thought of it the more he was inclined to believe that vascular disturbance was the basis of epileptic attacks. He supposed most of those present had had experience of cases of convulsions occurring in new-born babies in which there was sometimes, but not always, a history of great delay in the birth. During the delay it would seem not unreasonable to suppose that there would be a considerable degree of congestion of the brain and of the head generally, the result being that the child was very cyanosed at birth. But if this cyanosis was prolonged for any time, and cyanosis implied a want of oxyhaemoglobin, then the nerve cells and nerve tissue would suffer from anoxæmia. Nerve cells were very susceptible to the effects of anoxæmia, as might be seen, for example, in the increase and rapidity of

breathing when the respiratory centres suffered from want of oxygen. Just as the nerve cells of the respiratory centre responded more vigorously to stimuli when the blood supply to it was wanting in sufficient oxygen, so other cells of the brain responded in a similar manner. Thus it followed that the motor cells of the cortex, under the influence of anoxæmia, discharged rapid and increased nerve impulses which could be recognized as convulsive muscular spasms. But it had to be borne in mind that these children who had a prolonged birth and were born blue, did not necessarily suffer from convulsions soon after birth, but often after the lapse of some hours or even a day or two. So it would appear that the supervenosity, in other words the anoxæmia, in itself, in some cases at any rate, was not sufficient for the production of these convulsive attacks. In such cases why were the convulsions delayed? To the speaker it would seem that prolonged congestion which of course implied interference with the venous blood return, might have other serious effects. There was experimental evidence to show that the ligaturing of, say, the femoral vein was not followed by oedema until some hours after the operation and most practitioners must have observed in those not uncommon cases of venous thrombosis of the leg which took place after child-birth, that some hours elapsed after the thrombosis occurred before the oedema of the leg appeared.

Oedema of the brain then as well as of the head generally might well follow prolonged venous congestion. He thought that where there was any degree of oedema it would be admitted that there must be an imperfect blood supply to the cellular elements of the tissues and it did not seem unreasonable to suppose that the defective blood supply would lead to malnutrition of those same cellular elements and malnutrition together with anoxæmia might well be the causative factors in those violent nerve discharges which were seen in convulsive seizures. Further evidence of anoxæmia as a cause of convulsions might be witnessed almost every day in the casualty room of a large hospital. There it was not uncommon for strong men and women to fall down unconscious in a faint on seeing a wound exposed or blood streaming forth. In the faint they were deathly white, the heart beat very feebly and the pulse could scarcely be felt. While still unconscious, the patient suddenly became rigid and generalized convulsive movements took place. It was during this stage or at the commencement of it that a condition of cyanosis might be seen. Now in the speaker's view similar changes occurred in the brain to those which occurred in the skin, at first pallor and then venous congestion and in both phases anoxæmia, in the one case from defective blood supply and in the other phase, the blood supply being restored, from want of oxyhaemoglobin, the result being as already stated an undue irritation of the nerve cells.

Professor Mills referred to a patient who had wakened up one morning with disturbance of vision. When the eyes were examined it was found that this disturbance was due to a condition of hemiopia, the result of rupture of a vessel supplying the cortex in the region of the calcarine fissure of the right side. The patient had suffered for a considerable time from arteriosclerosis with attendant high blood pressure and contracted kidney. Immediately the diagnosis of hemiopia was made the patient had been sent to hospital, renal efficiency tests revealed that the kidney was doing its work satisfactorily. Two days after admission to hospital where he was completely at rest and was placed on a somewhat restricted diet and was well purged, he had had two severe convulsions, the second some hours after the first. This had been followed by a state of stupor which continued for a week. Examination during this period showed that he had slight left-sided hemiplegia and incomplete hemianæsthesia. After the lapse of a week or ten days the hemiplegia and hemianæsthesia had passed away, but it had been many weeks before the patient was restored to his normal mental condition. The view Professor Mills took of this case was that a more or less generalized oedema resulting from the vascular disturbance following the rupture of the vessel was responsible for the hemiplegia, hemianæsthesia and stupor together with the other symptoms already mentioned.

Dr. J. BOSTOCK said that he had been interested in both papers and he wished to express his gratitude to the authors. That of Dr. Prior had entailed an enormous amount of work. Dr. Campbell was right when he emphasized the importance of minor epilepsy. Though the parents of children did not recognize the fact, it was more important than major epilepsy. Dr. Bostock said that he had had some experience with protein hypersensitivity. He had used Parke Davis's preparations and unfortunately the tests were too often successful, oedema of the skin had occurred in such a large number of groups of protein that the result was useless. An exception was shown in the case of a girl, aged eight years, who had come to the Newcastle Hospital. Her doctor had rightly thought that she was suffering from hystero-epilepsy. She had been admitted to hospital and the fits had ceased. The mother had been instructed in regard to her attitude to the child and the hysterical fits had decreased in number under home routine. In the meantime typical fits had occurred and Dr. Bostock had found that she reacted to fish and the history had confirmed the result of the test, for one or two attacks had occurred after the child had partaken of tinned salmon. He had advised the mother that the child should not be given tinned salmon and so far she had been much better. Dr. Bostock thought that the occurrence of hystero-epilepsy and true epilepsy in the same patient was suggestive. In the treatment of epilepsy every system should be considered.

Dr. C. A. HOGG expressed his appreciation of both papers. He had had experience of epilepsy some years previously at Kenmore. He had tried many forms of treatment and had come back to the fact that the sheet anchor was bromide. In quite an empirical fashion he had combined with it bicarbonate of soda and tincture of aloes. In some instances the fits had been reduced from as many as twelve hundred a year to none for some years and then an occasional fit, perhaps one or two a year.

With systematic treatment by means of bromides combined with exclusion of salt from the diet the best results were obtained. In one or two instances the fits had been preceded by gastric symptoms and in these cases nitrate of silver with precautions against argyria was found useful. In conclusion Dr. Hogg laid stress on the importance of the medical attendant seeing the fits.

Dr. J. J. ROBERTSON asked for information in regard to the length of time that unconsciousness might last after a fit. He had recently seen a patient in consultation. Some of the fits had been followed by merely a short period of unconsciousness, then unconsciousness had lasted for two days and finally for four days. During this period real unconsciousness had been present and then a period characterized by increased reflexes had occurred to be followed by a period of irritability and finally by a period of apparently natural sleep. The father and mother of the patient were first cousins and there was a history of epilepsy on the mother's side. The unconsciousness had differed from that of other fits and he wondered whether another element had been introduced.

Dr. EVAN JONES discussed the true nature of epilepsy. He had at first been inclined to disagree with Professor Mills's remark about the vascular origin of epilepsy, but when Professor Mills had described the vascular disorder as an indirect cause of anoxæmia he (Dr. Evan Jones) had not differed so much, for he thought that interference with the metabolism of the cell lay at the root of the matter. Epilepsy had to be accepted as an example of the discharge of energy from the neurones. It was illogical to suggest as a cause anything not acting through neuronal control. The discharge must arise in the neuronal metabolism and it was necessary to take into account and explain the hypersensitivity of the neurone. The abnormality possibly lay in the synapses or in the accumulation in the nerve cell of energy. If this were so it would be possible to explain the peculiar mental state of a patient before a fit and the fact that when the fit had occurred the patient's mentality became normal.

Dr. J. A. L. WALLACE thanked Dr. Campbell for his paper and said that the consideration of epilepsy in childhood was most important. If the disease were to be

always recognized in children, early treatment might ameliorate their condition and prevent the later development of insanity with the epilepsy. The adult patients with epilepsy constituted a difficult and dangerous class of patients in mental hospitals. In discussing Dr. Prior's paper Dr. Wallace postulated the existence of a common factor underlying nervous instability and convulsions and cases of glandular abnormality. Finally he referred to the condition recently described as idiopathic narcolepsy. He said that it appeared to be akin to *petit mal*. It was characterized by sudden fits of sleep, associated with emotional excitement. He thought that narcolepsy might be similar to some of the minor fits of epilepsy and he asked Dr. Campbell's opinion on the matter.

Dr. R. J. MILLARD thanked both authors for their thorough and painstaking productions. Although he was personally more interested in Dr. Campbell's paper, that of Dr. Prior represented a great deal of work and was "full of meat." It occurred to him that the biochemist was the man most likely to be of help in elucidating the problem. In this connexion he thought that an experience gained a few weeks previously was of interest. A diabetic patient had been taking "Insulin" regularly three times a day before meals. One evening he had taken his "Insulin" as usual, but had not felt inclined for his evening meal. Shortly afterwards he had taken a series of fits. When Dr. Millard saw him he had been in a convulsed and spasmodic state. Dr. Millard had then given him glucose by the mouth and by intravenous injection. One hour later the patient had been apparently normal. Of course this was not epilepsy, but it was fairly obvious that lowering of the blood sugar percentage had caused the convulsions. This suggested a possible endocrine influence on epilepsy. In the case quoted the "Insulin" had brought the blood sugar down to a level which was below that necessary for the neurones. Dr. Millard also referred to a somewhat similar case in which a boy, aged sixteen years, had yielded a figure below 0.04 on examination of the blood sugar when he was in a comatose state. He thought that some change of this sort might take place in an epileptic before the onset of the actual fit and might account for the prodromal change in demeanour by which a trained attendant could usually tell when a fit was about to occur.

Dr. Campbell in reply thanked those present for the attention that they had given to his paper. He felt most humble, however, when he compared his paper with that of Dr. Prior. It was indeed "full of meat." In fact Dr. Prior had approached his subject, as he always did, in a thoroughly scientific way. Dr. Prior was not the only person on the staff of the mental hospitals who was gifted with the spirit of research, and he thought that the Inspector-General had every reason to feel proud of his team of workers.

In reply to Dr. Wallace Dr. Campbell said that he had no experience of narcolepsy. The condition was rare. He had, of course, read the paper and it had struck him that the patient was in as much danger as one suffering from ordinary epilepsy, for there was no knowing when sudden attacks of sleep would overtake him. When the brain was examined *post mortem* in a case of *status epilepticus* one striking fact was that it was exceedingly dry. The cerebro-spinal fluid had become absorbed and the brain was in a state of oedema and intensely congested, the pattern of the veins standing out with clearness. At the same time in regard to the vascular origin of epilepsy such supervenosity had always been regarded as the effect not the cause of a succession of fits. An interesting point in this connexion was the fact that for the production of fits in an animal all that was required was a pons and medulla. It was possible to produce epilepsy in the decerebrate animal.

Dr. R. A. NOBLE, on being called upon to reply, thanked the authors of the two papers and referred to the importance of the hypersensitivity of the neuronal mechanism. It was important to find out why the hypersensitivity occurred. The vascular hypothesis offered an explanation. He described the history of a returned soldier who had suffered from sixty fits in two days while an inmate at the Lewisham Hospital. One fit had occurred every half-hour and the patient was quite unconscious. Lumbar

puncture had relieved the condition and X ray examination revealed a foreign body in the skull just above the orbit. After removal of the foreign body by Dr. Poate no more fits had occurred. Why had these sudden attacks taken place? The patient was a poultry farmer and the day before the occurrence of the fits had been exposed unduly to the sun. Obviously an œdema had occurred and this with the irritation of the foreign body had caused hypersensitivity. After referring to the importance of lumbar puncture, Dr. Noble said that in hystero-epilepsy it was difficult to tell where hysteria left off and true epilepsy went on. The subjects of hystero-epilepsy all had some unconscious motive for the attacks. Thus a girl of eighteen years had always had fits in sunlight, but other light had had no effect. Some domestic difficulty had supplied the unconscious motive. When the patient was in hospital and the unconscious motive was not operative the patient had been put into the sunlight without the occurrence of fits. The necessary point was the detection of the unconscious motive.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

- Dawson, William Siegfried, M.B., B.Ch., 1916 (Univ. Oxford); M.R.C.P. (London), 1920; 175, Macquarie Street, Sydney.
 Eakin, Matthew John, M.B., Ch.M., 1925 (Univ. Sydney), Murwillumbah.
 Figtree, Edward Richardson, M.B., Ch.M., 1925 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.
 Levy, Albert Lewis, L.R.C.S. (Edinburgh), 1895; L.R.C.P. (Edinburgh), 1895; L.F.P.S. (Glasgow), 1895; 219, Macquarie Street, Sydney.
 Little, William Norman, M.B., Ch.M., 1925 (Univ. Sydney), Yass.
 Markell, Phillip Justin, M.B., Ch.M., 1925 (Univ. Sydney), 15, Onslow Avenue, Elizabeth Bay.
 McCloy, Winifred Alice, M.B., Ch.M., 1918 (Univ. Sydney), Hornsby.
 McGeorge, John Alexander Hughes, M.B., Ch.M., 1927 (Univ. Sydney), Mental Hospital, North Parramatta.
 Moore, Brooke, M.B., Ch.M., 1924 (Univ. Sydney), Bathurst.
 Ross, David Mitchell, M.B., Ch.M., 1926 (Univ. Sydney), Manly.
 Steigrad, Joseph, M.B., Ch.M., 1926 (Univ. Sydney), Sydney Hospital.
 le Cappelaine-Taylor, Royal Stanley, M.B., Ch.M., 1925 (Univ. Sydney), Glen Ayr Avenue, Bondi.

THE undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

- Lehman, Sidney James, M.B., B.S., 1923 (Univ. Melbourne), Coburg.

Public Health.

NATIONAL HEALTH INSURANCE.

(Continued from page 769.)

III.—Administration.

The systems of administration adopted for the supervision and control of compulsory national insurance in the various countries differ very widely in accordance with the political organization and social institutions of each country, but may, however, be generally classified into two main groups—(i) administration through approved organizations which are subject to certain Government supervision, (ii) administration through a central organization embracing all the insured persons.

(a) Administration through Approved Organizations.

In many countries the national insurance schemes which have been instituted, are not national in the full meaning of that term, but only to the extent that the Government enforces the payment of contributions in respect of those to whom the scheme applies. In the majority of countries compulsory insurance has been brought into effect by the transformation of voluntary mutual aid into compulsory insurance and, consequently, the system of administration in operation is based to some extent on the voluntary mutual organizations existing at the inception of the scheme. Mutual benefit societies have thus been adopted in many instances as the main insurance organizations. In other cases they have been adopted as substitute organizations working in cooperation with a national organization established for the purpose. Although subject to Government supervision, yet they are free to control their own affairs within prescribed limits, the board of management of such societies being in some systems entirely composed of representatives of the society's members or in other countries of representatives of both the employers and insured persons, whilst in other cases representatives appointed by the local government authorities are also included on the executive. In those countries in which a classification according to trades has been adopted, the societies belonging to individual business undertakings are the only insurance organizations recognized.

In Great Britain a system of approved societies was instituted in order to avoid the difficulties associated with the administration of the scheme by existing mutual benefit societies. Under the approved societies system any existing mutual benefit organizations which have accepted the special regulations, and made their constitution and management conform to requirements, may apply for registration by the State as approved societies in order to obtain the advantages reserved for such societies. The national insurance section of their work is generally kept quite separate from the voluntary section and the control, membership and funds of the voluntary society are not interfered with in any way. Any group of people may form an approved society and apply for registration under the scheme. The different types of organizations which act as approved societies, include friendly societies, trade union benefit funds, guild funds, employees' provident funds, establishment or shop funds, cooperative societies and mutual societies formed by life assurance companies. The societies vary in membership from that with over 2,000,000 members to those with a membership of less than 50.

One of the fundamental principles of insurance is that a required number of people must be exposed to the risk insured against and a system which provides for small approved societies, is contrary to this principle. Although it may be considered desirable that the numerous existing mutual benefit societies should be incorporated in the national insurance scheme, yet it has been suggested that some of the disadvantages of the approved society system would be removed if it is prescribed that only those possessing a certain minimum membership can be eligible as approved societies, as it is the multiplicity of small societies which burden the scheme. On the other hand, however, experience has also shown that there is a danger of creating vested interests which are not of benefit to the national scheme.

The segregation of insured persons into particular societies is considered to be inequitable as there is a consequent variation in the average risk, with the result that a preponderance of healthy lives may be grouped together in one society and a preponderance of unhealthy lives exist in others and this segregation of membership leads to widely divergent rates of benefits. A scheme which provides for the selection of members and consequent variation in rates of benefits, is incompatible with the essential basis of a national pooling of risks. The approved society system is not national in practice, as equal benefits are not available for all insured persons and an inequality arises in the benefits paid to different persons for the same contribution. It has been authoritatively stated that in a national system of compulsory insurance with uniform contributions the provision of uniform benefits for all insured persons is incompatible with administration through approved societies.

Where provision is made for the payment of a flat rate premium, the members of particular trades may be seriously prejudiced, as the results of actuarial valuations of approved societies generally show that the occupation of insured members is mainly responsible for the financial divergencies between societies. Nearly two million insured persons in England were unable to participate in the additional benefits available in other societies from the surplus on valuation. The statement that competition between approved societies is good for the scheme is not supported by experience, which shows that segregation gives some societies an unequal advantage over others and thus destroys any incentive for competition. Further, no competition can take place with respect to certain benefits provided, as other factors determine the cost of such benefits. The great disparity which has arisen between the financial status of the numerous approved societies, was not generally anticipated at the inception of the scheme and owing to the disparities existing between various branches of certain societies the valuation of each society as one complete unit has been advocated strongly. In some cases the various branches of an approved society contribute to a central fund from which the amount of any branch deficiency is drawn, and there is no doubt that the question of inequality of benefits will not arise if all contributions are paid into one national insurance fund covering the whole of Australia.

Mutual benefit societies which become approved societies, usually desire to continue their restrictions on membership, even with regard to their compulsory members and the Government under the approved society system has to specially provide for those who owing to ill health, age or to the special provisions of the society are ineligible for membership and also for the person who does not wish to join any existing society. It is anticipated that a fairly large percentage of wage-earners in Australia would require such arrangements to be made. Any person entitled to insurance may apply to become an insured member of an approved society, which may admit or reject such applicant in accordance with its rules, but must not reject an applicant on the grounds of age alone, although those who are likely to be a charge upon the funds are generally excluded by medical examination. The insured person has a statutory right to transfer from one approved society to another, if he so desires and the burden of proof in any case of refusal of an application to transfer rests upon the society from which the member wishes to withdraw. The question of transfers involved in a system of approved society administration is very complicated owing to the mobility of labour and renders the administration of scattered members a very difficult problem. Where an insured person transfers from one society to another or even from one branch to another branch of the same society, he usually loses his rights to additional benefits. Under a national unified system the question of transfers from district to district would present no difficulties.

The approved society system involves enormous and complicated administration. Although it was intended at the inception of the scheme that each society should be controlled by its members, that intention has not always been carried out owing to the apathy of members and the size of the societies. Even with provision for self-government the control is in practice in the hands of the society's officials and the question of democratic control is largely theoretical and owing to the constitution of the societies is inoperative; in the larger organizations especially the machinery for self-government is found to be impracticable. There is also a great diversity of interests amongst the various societies and consequently it is not possible to obtain effective coordination in the working of the national scheme on such lines. It has been suggested that the administration of national insurance by mutual associations is more personal and democratic than if it were directly administered by a Government department, but experience shows that the majority of members do not take any interest in the administration of their society and in many cases they only know it through the society's local agent.

It is extremely difficult for the average insured person to understand the method by which his arrears in contributions, benefits, etc., are calculated. Disputes are continually

arising between the societies and insured persons concerning the question of title to and payment of benefits and these have necessitated the establishment of elaborate systems of courts of arbitration and of insurance courts. There are also strong complaints by employers against the amount of clerical work necessitated by the regulations made under the approved society system, but this has been overcome to a great extent where the control is centred in one administrative organization instead of the dual control of approved societies. In connexion with the arrangements for medical benefit it was found to be impracticable for the societies to establish a satisfactory basis and this duty necessarily devolved on the central administration. There is no doubt that the impersonal factor in Government administration has many advantages.

Experience has proved that national schemes which provide for administration through approved organizations, are cumbersome, complex and not the most satisfactory or desirable basis, as they lead to overlapping, unnecessary competition and high administrative expenditure. Numerous societies of various types compete with one another in each district, with consequent overlapping in activities and increase in administrative expenses. It is stated that in England 65% of the total number of societies comprise only 2% of the total number of insured persons, whilst on the other hand 2½% of the societies include 76% of the insured persons. It is stated that there are instances where in one district over five hundred societies are operating, some of which have only ten local members each, while in another district there are one hundred societies represented by only one local member each. Some schemes are said to be overburdened with their relationship to approved societies and the complexity of the schemes has resulted from the attitude adopted towards existing organizations and from attempts to utilize their machinery. If the administrative difficulties had been fully appreciated at the inception of the various schemes, many unsatisfactory developments would probably have been avoided if a new administrative system had been planned at the inception of the scheme instead of adopting that of existing organizations.

As the field of application of national insurance is extended, the predominant tendency is to replace such mutual organizations by a system of administration founded on a district or territorial basis, the district office being responsible for the insurance of all persons liable to insurance who are working in the area administered by the office, the board of management of which includes in the majority of cases representatives of the employees and the employers. This district organization enables the most effective system of administration to be made available in accordance with local conditions and also results in an average grouping, as it provides an equalization between the various occupations of insured persons. Where approved societies are not organized on a geographical basis, it is impossible to ascertain from their records the sickness experience among insured persons in any locality.

(b) *Mutual Benefit Societies in Operation in Australia.*

The friendly society system in Australia is said to be established upon a sufficiently sound basis to enable it to be utilized, if such were considered the most desirable method of administration and control of a national insurance scheme in Australia. Considerable variation exists, however, in the financial status, scope and membership of the societies, whilst the extent of their operations also varies appreciably in each State. The method suggested by which friendly societies could be adapted to a national insurance scheme has generally been upon the approved society basis. Some witnesses have expressed the opinion that friendly societies should be given sole control or a monopoly over the administration of national insurance throughout Australia, but this suggestion is not generally supported as the total membership of existing friendly societies is at present equivalent to only approximately 9% of the total population and to about one-third of the wage-earners of Australia. National insurance is, as its name implies, a matter of national concern and should not be used as a monopoly by any group of individuals, but should embrace all in one mutual association. That which is a national need should be nationally applied and con-

trolled. One of the reasons advanced in favour of control by friendly societies is that of the local supervision which exists in respect of sickness benefit, which entails the heaviest management cost, and also because the societies' administrative machinery is available at the present time in most of the more densely populated areas of the Commonwealth. Branches of approved societies, however, would necessarily have to be opened in many populated localities where at present no friendly society is operating and any provision for the inclusion of additional societies would unnecessarily extend the present undesirable position resulting from the fact that more societies are now operating in Australia than the population warrants. Friendly societies which have formed approved societies, comprise about 46% of the insured population in England.

At the end of the year 1924-1925 there were 162 registered friendly societies operating in Australia, with a total of 5,465 branches. Similar friendly societies operate in most of the States and although linked together from the point of view of sentiment, they are in the majority of cases quite administratively independent of similar societies in the same State or in other States, there being in the majority of cases no Commonwealth controlling body for each society. Many are branches of societies which have their head offices overseas and have been built on the peculiar traditions and political conditions of older countries. The societies are governed in accordance with their constitutions and by their rules which must receive the approval of the Government Registrar of Friendly Societies, and must be in accordance with the *Friendly Societies Act* of the State. They are all subject to the Supervision of the Registrar and to regular valuations by the Government Actuary, but the Registrars have generally adopted the policy of leaving the societies as free as possible to carry out their own rules. The *Friendly Societies Act* in force in the several States, whilst generally similar, yet differ in some very important provisions and it has been suggested that the application of the friendly society system to national insurance would necessitate an amendment of the *Friendly Societies Act* in each State in order to make a uniform act for the whole of the Commonwealth.

The societies are based on various principles and those principles direct their administration and their financial position depends to a great extent on the nature of their administration. The general system of administration of friendly societies in each State is fairly similar, the government of the societies usually consisting of a central executive, trustees and directors, which comprise the grand lodge and control the administration of the society generally and organize the various branches, under their control. The financial members who attend the meetings of the various branches elect representatives to the annual session of the order which decides the question of alteration of rules, etc., and elects grand lodge officers. The members thus have a direct representation in the control of the society through the branch meetings, but this is mainly theoretical, as the percentage of members which attends meetings is small and is diminishing. The rules of some societies are cumbrous and it is said that many members do not understand them. The general secretary of the society is usually a full-time officer specially selected for the work. Each branch manages its own local affairs, subject to the supervision of the central executive; in some societies inspectors are appointed to visit and inspect the various branches. The branch accounts are not always kept satisfactorily, owing to the difficulty of obtaining a competent local secretary who is able to devote sufficient time to his duties, the branch officials being not as a rule trained business men, but in most instances they have volunteered their services in the interests of the society and do fairly well under the circumstances. The friendly society system of book-keeping varies in method and efficiency practically in every society and it would need considerable reorganization for national insurance purposes, as a uniform system in a prescribed form would be essential.

The opinion has been expressed that it is unnecessary that a number of societies, working under different forms of management and all doing practically similar work, should be operating in the same district and for the same people and that mutual benefit societies could amalgamate

into one approved organization for the purpose of administering the compulsory national insurance scheme, whilst retaining their separate entities under the voluntary friendly societies' system. The work could be better and more effectively done by amalgamation, especially in rural districts where branches are often very small and involve unnecessarily heavy expenditure and administrative work. Experience in other countries has proved that the multiplicity of organizations does not tend towards efficiency and consequently steps have been taken in many cases towards amalgamation, the consolidation of branches of some societies and amalgamation of others on a geographical basis resulting in more efficient and less complicated administration. The friendly societies in Australia have already formed an association in each State for the consideration of general questions and have also associated in many districts for the purpose of forming dispensaries and it should be possible for them to cooperate in a similar manner for the purpose of taking part in the administration of national insurance in the various districts throughout Australia. If total amalgamation in each State for national insurance purposes were impossible of achievement, it has been suggested that many difficulties would be overcome by an amalgamation of the smaller societies, as careful combination of smaller societies would produce larger societies with a sickness experience nearer the average for all insured persons. A system of district cooperation for the purpose of administering national insurance benefits, however, should be possible and is essential to the effective and economical management of any system of administration through mutual benefit societies in Australia. It is considered that such cooperation would in no way hamper the various societies' freedom of control in the administration of their voluntary benefits and their present membership and separate entity with regard to funds would not be encroached upon, whilst their special restrictions as to membership of the voluntary section would be preserved and their work would continue to be supervised by the Government Registrar and Actuary. It has been suggested that by this means the administration of national insurance would work in harmony with the existing friendly society system.

Evidence is divided on the question of trade unions being accepted as approved societies, whilst it is generally opposed to commercial institutions being permitted to take part in the control of a national scheme. In the year 1925 there were 743 trade unions operating in Australia, with a total of 1,651 branches. In some unions the State organizations are bound together under a system of unification and centralized control, there being 332 district organizations and interstate groups of organizations, with a total membership of 795,722. If a system of approved societies were adopted, there is no reason why trade union benefit funds and establishment funds should not have the same opportunities as other mutual benefit associations of registering as approved societies for the administration of the national insurance scheme. In Great Britain industrial assurance societies have become approved societies under the *National Insurance Act*, but such organizations can only effectively operate in the capital cities and large towns in Australia, and their administrative cost for industrial assurance business is very heavy owing to the system of collecting premiums by agents. It has been stated, however, that the success of the scheme in England has depended to a great extent upon the effective administration of the industrial insurance companies as centralized approved societies and which include two-fifths of the total insured persons.

(c) Administration Through a Central Organization.

Most important schemes in operation in other countries have a central organization entrusted with the general supervision and inspection of the national insurance scheme; the scope of this organization differs widely in the several countries, as it depends upon the political and social systems in operation in each country. Actuarial valuations in other countries have shown that the financial success of the national insurance scheme is to a great extent dependent upon the quality of the administration and experience has generally shown that a unified system

is essential to efficiency, with the result that efforts have been made towards the establishment of a central Government organization which will coordinate the work and bring the several systems together. It is absolutely essential that there must be effective governmental supervision and control over a national scheme of insurance to which employers, employees and the Government are compelled to contribute. It is the duty of the Government to undertake the effective supervision of the compulsory institutions which it has created.

The general administration of national health insurance in England and Wales is controlled by the Minister of Health, on whom has been conferred legislative, administrative and judicial powers. The organization includes three departments, *viz.*: The Ministry of Health, the Government Actuary's Department and the Audit Department. The central department's functions are confined to supervision only and it is said that effective disciplinary control over the various societies is not provided and the department has no power to enter the internal affairs of a society. Although model rules are issued to approved societies by the central administration, their adoption is purely optional, as there is no regulation which enforces such rules as the basis of the rules of all societies. It has been stated that the Government administration under the scheme does not possess adequate powers which would enable effective action to be taken in cases where the administration of a society is below the required standard. The medical benefits are administered by special statutory committees created for every county and county borough, comprising elected representatives of insured persons, local government authorities, medical practitioners and others in the area. The post office is utilized in the scheme of administration for the collection through the sale of insurance stamps of contributions paid and for the issue of contribution cards in special cases. The unemployment insurance scheme and the old age, widows' and orphans' pensions, however, are administered directly by the Government and not by the approved society system.

The national insurance schemes instituted in other countries have been in the nature of experiments in social legislation and their experience has shown in many cases that amendments in the original system of administration were essential. It has been suggested that considerable difficulty will be met with in operating national insurance over such large territory with such scattered population as Australia and that conditions of work, wages and living are so different that an entirely different administrative scheme to those operating in other countries will be required to meet the needs of Australia. Further, that it would be more desirable to leave mutual benefit organizations free to continue their operations and for the Government to undertake the administration of national insurance in a similar manner to that in which the Commonwealth invalid and old-age pensions and the maternity allowances are administered at present, and in the administration of which the mutual benefit societies do not take part, the post office being utilized for the payment of benefits. The existence of mutual benefit associations must be taken into consideration and it is suggested that their continuance will be more encouraged if they remain free to continue their present functions unhampered by inclusion in the national insurance scheme. Every effort should be made to prevent any injury being done to the friendly society system. The opinion has been expressed that a comprehensive system of national insurance will have an injurious effect on existing mutual benefit societies, but although such predictions were made in England, experience has proved that the voluntary societies are now in a better numerical and financial position than they were prior to the inception of the national insurance scheme. National insurance will only provide certain assured minimum benefits and not adequate maintenance and thus wage- and salary-earners will be enabled to provide additional benefits by means of voluntary mutual associations. Such an arrangement for additional benefits has many advantages. It is estimated that one-third of the compulsory insured persons in England are also voluntary members of mutual benefit societies.

The advantages of one administrative organization far outnumber any other considerations. The most desirable,

effective and economical system will be attained if a central organization is established to administer a unified national insurance fund for the whole of Australia through district offices. Such administrative authority should include representatives of the three contributing parties, *viz.*: the Government, employers and insured persons, as it is desirable that all interested sections should take part in the administration of the national insurance fund. The various States should be divided into suitable administrative districts, each supervised by a district insurance office under the control of the central administration. Each district organization will be a complete administrative unit, but it is essential that insurance funds be pooled for the whole of the Commonwealth. A local advisory committee of management could be appointed in each administrative district to enable the most suitable administrative arrangements to be made to meet local conditions, such committee being comprised of representatives of the various mutual benefit societies operating in the district, trade unions, medical practitioners and other organizations interested in the national insurance scheme. The local agents appointed in the subdistricts or branches would be in most cases part-time officers under the direct supervision and control of the district administration. It will be also necessary to establish an inspection staff to superintend the arrangements for the collection of contributions.

In determining whether the claimant for sickness or invalidity benefit is incapacitated for work, the administrative officials in other countries are ordinarily guided by the certificates issued by medical practitioners and suitable arrangements will need to be made with general medical practitioners throughout Australia for the production of certificates as to the insured person's incapacity for work. It is very desirable that such medical certificates should afford sufficient information with respect to the nature and cause of incapacity, as these records will be of great value for statistical investigations which should be instituted in connexion with the scheme. A system of district medical officers is essential to cope with the questions of malingering and certification which may seriously affect the solvency of the fund. Such full-time officers would supervise the arrangements for medical certification in each administrative district and would be available as medical referees when required; their duties, however, would not include any disciplinary powers or right to treatment of patients. It is desirable that the district medical officers should be associated with the Health Department in order that they may thus establish coordination between the public health services and the national insurance fund.

Experience in other countries has shown that it is most essential that the many units administering the various social services should be amalgamated or coordinated. In Australia at the present time several more or less independent units have functions which are closely related to the proposed national insurance scheme and endeavours should be made so far as the Commonwealth Departments at least are concerned to coordinate them with the administration of the national insurance fund.

In concluding our Final Report, we desire to place on record our high appreciation of the invaluable services rendered by our Secretary, Mr. H. C. Green, of the Commonwealth Bureau of Census and Statistics, in the conduct of our extensive inquiry, in collating the immense volume of data submitted, and in the exacting work involved in the preparation of our reports. Our complex and onerous task has been very materially lightened by the exactitude and technical knowledge which Mr. Green has readily on all occasions brought to our guidance in connexion with the many intricacies of the inquiry, and also by the efficiency and resource which he has applied to the considerable research undertaken with respect to the development of national insurance legislation in other countries. Throughout our lengthy inquiry we have been greatly indebted to him for his unfailing courtesy, tact and organizing ability.

We would also express our appreciation of the services of the Staff of the Commission who have willingly undertaken every task we have placed upon them.

We also acknowledge our obligations to Mr. C. H. Wickens, Commonwealth Statistician and Actuary, for his very valuable assistance in the preparation of the many

actuarial statements required, to Mr. M. Hillary, Pensions Officer, Australia House, London, for his comprehensive reports on the legislative provision for national insurance in other countries, and to the many witnesses who have given us the benefit of their valuable knowledge and experience.

Throughout the inquiry your Commissioners have made every effort to obtain all available local evidence which would assist in the consideration of the many important social questions referred to them, but the fact that detailed first-hand information has not been available concerning the experience of the various national insurance schemes operating in other countries has often proved a very considerable disadvantage during the inquiry.

Your Commissioners sincerely hope, however, that, as the result of their labours extending over a period of three and a half years, their recommendations, which are based on humanitarian lines and offer such great benefit to the individual and the community and on all of which there has been complete unanimity by your Commissioners, will find a ready acceptance by the Government and people of the Commonwealth.

Recommendations.

For the convenience of our readers we reproduce here the recommendations of the Royal Commissioners attached to each of the four progress reports. The recommendations of the first report were published in THE MEDICAL JOURNAL OF AUSTRALIA of June 6, 1925 (page 606).

First Progress Report.

Your Commissioners recommend—

1. That a national insurance fund be instituted which will provide for the payment of sickness, invalidity, maternity and superannuation benefits to insured members and

- (i) That membership of such fund be compulsory;
- (ii) that a sickness benefit of 30s. per week be payable to adult insured members during the first six months when incapacitated for work as the result of sickness;
- (iii) that a sickness benefit not exceeding 20s. per week be payable to insured members under twenty-one years of age during similar incapacity;
- (iv) that equivalent benefits be payable to insured members when incapacitated for work as the result of accident that the question of including workers' compensation legislation under the national insurance fund administration be fully considered;
- (v) that an invalidity benefit of 20s. per week be payable to insured members during that period when incapacitated for work as the result of sickness or accident extending beyond six months' duration;
- (vi) that a maternity benefit of 20s. per week be payable for a period of two weeks prior to and for four weeks after the confinement of a female insured member or the wife of an insured member;
- (vii) That as the cost of the existing maternity allowance is at present borne solely by the Commonwealth, this responsibility should continue with respect to the maternity benefit provided under the national insurance fund;
- (viii) that a superannuation benefit of 20s. per week be payable to male insured members after attainment of age sixty-five and to female insured members after attainment of age sixty;
- (ix) that the existing rights of pensioners under the *Commonwealth Invalid and Old Age Pensions Act, 1908-1923*, should not be interfered with;
- (x) that a child allowance of 5s. per week in respect of each dependent child under age sixteen be payable to the insured member when incapacitated for work.

2. That a national health scheme be instituted which will provide adequate medical treatment for the people and which will provide the requisite machinery for the prevention of sickness and accident and

- (i) That such scheme be dissociated from the administration of the national insurance fund;
- (ii) that the functions and objects of the Health Department be extended in such manner as will enable provision to be made as early as possible for the effective supervision of adequate medical services, especially with respect to maternity treatment.

Second Progress Report.

Your Commissioners recommend that, although it is not possible to obtain exact figures as to the volume and incidence of unemployment in the various industries throughout Australia, sufficient evidence is available to indicate that unemployment is a prevalent factor in some industries in certain periods of the year and that action should be taken by the Commonwealth Government towards minimizing the risks of unemployment and towards the provision of relief of distress arising therefrom:

- (a) That an unemployment council, comprising representatives appointed by the Government, the employers' organizations and the trade unions, be constituted—
 - (i) to establish and supervise a national system of employment bureaux throughout Australia;
 - (ii) to regulate and supervise the existing private labour exchanges;
 - (iii) to collect, tabulate and analyse detailed statistical data as to the supply of and demand for employment in the various industries throughout the year;
 - (iv) to conduct special inquiries as to the incidence and causation of unemployment in the various industries;
 - (v) to cooperate with private employers, Government departments and local authorities in an endeavour to provide avenues of employment and to regulate the demand for labour;
 - (vi) to cooperate with the educational departments in an endeavour to institute an effective and extensive system of technical training;
 - (vii) to cooperate with the immigration departments with respect to the employment of immigrants;
 - (viii) to regularly furnish detailed information as to the trend of employment;
- (b) That a system of insurance against unemployment be instituted to meet those risks which are found to be unavoidable and where assistance to necessitous cases is warranted.

Third Progress Report.

Your Commissioners recommend—

1. That more effective provision can be made by a comprehensive national insurance scheme than by amending the *Invalid and Old Age Pensions Act* so as to provide for the payment of destitute allowances;

2. that pending the institution of a national insurance scheme the Commissioner of Pensions be granted certain discretionary powers with respect to rejected claims for pensions in cases where the claimant is in destitute circumstances.

Fourth and Final Progress Report.

Your Commissioners recommend:

A.—Membership:

- (i) That the compulsory provisions of the national insurance fund shall apply to all wage and salary-earners in Australia who are over the age of sixteen years;
- (ii) that the voluntary provisions shall apply to all workers on own account and proprietors of small establishments;

- (iii) that exemption from the compulsory provisions shall be granted to members of mutual benefit associations which guarantee and to those in employment which secures equal benefits to those provided by the national insurance fund.

B.—Finance:

- (i) That the total cost of the national insurance scheme shall be met by regular weekly contributions payable in respect of each insured person by the Commonwealth, the employer and the insured person;
- (ii) that contributions shall not be payable during any period in which the insured person is unemployed or in receipt of benefit;
- (iii) that a flat rate of contribution be adopted for all insured males and similarly for all insured females;
- (iv) that the rate of contribution for each benefit shall be that actuarially calculated for entrants at age sixteen together with provision for the accumulation of adequate reserves;
- (v) that the employee's contribution shall be deducted from wages and the employer's and employee's contributions collected by means of insurance stamps to be affixed by the employer to the employee's contribution card;
- (vi) that all contributions shall be payable to a central national insurance fund;
- (vii) that the accumulated funds be invested in the extension of social services available to insured persons;
- (viii) that actuarial valuations of the fund shall be made at regular periods;
- (ix) that the fund shall be subject to audit by the Commonwealth Auditor-General.

C.—Administration:

- (i) That the central administration of the national insurance fund include representatives of the contributing parties, *viz.*: the Commonwealth, employers and insured persons;
- (ii) that a system of district administration be instituted with a district office in charge of the administration of the fund within each district;
- (iii) that a local advisory committee comprising representatives of existing mutual benefit societies, employers' associations, trade unions, medical practitioners and other interested organizations be appointed in each district;
- (iv) that arrangements be made with general medical practitioners for the medical certification of applicants for sickness and invalidity benefits;
- (v) that a district medical officer be appointed to supervise the arrangements for medical certification in each district;
- (vi) that efforts be made to coordinate the administration of the national insurance fund with the administration of Commonwealth invalid and old age pensions, maternity allowances and war pensions;
- (vii) that the system of labour bureaux recommended in our second progress report be utilized for the purpose of certification of unemployment in connexion with exemption from contributions;
- (viii) that, wherever practicable, the administrative machinery of existing mutual benefit associations be availed of in the administration of each district.

Post-Graduate Work.

MELBOURNE PERMANENT COMMITTEE FOR POST-GRADUATE WORK.

The Melbourne Permanent Committee for Post-Graduate Work has been able to arrange through the courtesy of Dr. MacEachern, of the American College of Surgeons, a special visit by two distinguished Americans, Dr. Allen Kanavel, of the Cook County Hospital, and Professor Charles Elliot, North-West University, Chicago.

Dr. Kanavel is world-famous for his monograph on infections of the hand and for numerous other contributions to surgical literature.

Dr. Elliot is recognized as one of the leading physicians of North America and has contributed much to the knowledge of diabetes, jaundice and diseases of the thyroid and spleen.

Dr. Kanavel will lecture on surgical problems connected with the hand, wrist and forearm and on some other surgical subjects. Dr. Elliot will lecture on diseases of the thyroid and on jaundice. These lectures will be illustrated by lantern and cinematographic pictures.

The lecturers have only a limited time at their disposal, but each will give six lectures at the Medical Society Hall on the following dates:

Tuesday,	August 23,	8.15 p.m.—Dr. Kanavel. 9.15 p.m.—Dr. Elliot.
Wednesday,	August 24,	8.15 p.m.—Dr. Elliot 9.15 p.m.—Dr. Kanavel.
Thursday,	August 25,	8.15 p.m.—Dr. Kanavel. 9.15 p.m.—Dr. Elliot.
Monday,	August 29,	8.15 p.m.—Dr. Elliot. 9.15 p.m.—Dr. Kanavel.
Tuesday,	August 30,	8.15 p.m.—Dr. Kanavel. 9.15 p.m.—Dr. Elliot.
Wednesday,	August 31,	8.15 p.m.—Dr. Elliot. 9.15 p.m.—Dr. Kanavel.

In addition the Committee has made arrangements that during the fortnight members attending this course will have access without extra charge to all the routine work in the in-patient, the out-patient and special departments and in the operating theatres of the various metropolitan hospitals.

The fee for this course of twelve lectures is five guineas.

During the same period the annual course in obstetrics will be held at the Women's Hospital, Carlton, and members of that course may, if they wish, attend the special course in the evenings, on payment of the additional fee.

The Honorary Secretaries, Dr. J. W. Dunbar Hooper and Dr. Harold R. Dew, would be pleased to accept applications and receive subscriptions (which should be paid in advance) as soon as possible in order that they may know the number of practitioners likely to attend.

WINTER COURSE IN OBSTETRICS.

THE annual winter course of post-graduate work in obstetrics will be held at the Women's Hospital, Melbourne, from August 22 to September 5, 1927. The course comprises attendance in all the departments of the hospital for routine work, as well as at special lectures and demonstrations by members of the staff. Arrangements have been made whereby a limited number of graduates can enter into residence at the hospital.

The fees for this course are three guineas for clinical work, demonstrations and attendance at lectures and four guineas in addition for board and residence at the hospital per week.

It is hoped that members taking the course will avail themselves of the fact that it will be concurrent with the special series of lectures to be given by Dr. Allen B. Kanavel and Dr. Charles Elliot and endeavour to attend both courses.

Further details may be had from the Honorary Secretaries, Dr. J. W. Dunbar Hooper and Dr. Harold R. Dew.

Correspondence.

RADIOTHERAPY.

SIR: Dr. Archie Aspinall's letter in your issue of April 30 finishes up: "In the meantime it would be helpful if Dr. Molesworth could give detailed results of, say, fifty or one hundred consecutive cases of proved malignant disease treated by him with radiotherapy."

In the face of our present knowledge and the immense amount of work which has been done in the past ten years in various parts of the world and even in Australia, this does seem an extraordinarily crude, not to say superfluous, method of demonstration, particularly as such might include treatment of various highly radio-sensitive neoplasms, such as lymphosarcoma, rodent ulcer *et cetera*, less radio-sensitive growths, such as scirrhus carcinoma of the breast, carcinoma of the stomach *et cetera*, perhaps abandoned by surgeons or postoperative prophylactic therapy, in fact, an extremely variegated collection of favourable, unfavourable, early, late, radio-sensitive and radio-resistant growths, totally different in nature and in various parts of the body.

If Dr. Aspinall really desires to learn more of the effect of deep radiotherapy, why not consult the already very voluminous literature where the effects of treatment on different types of growths and in different localities are already described at great length. Not only in the literature coming from abroad, but also in our own MEDICAL JOURNAL OF AUSTRALIA a good many reports of cases treated both successfully and unsuccessfully, are available. As an instance, at the Erlangen Clinic, many thousands of cases of uterine carcinomata alone have been treated by X ray therapy, whilst special reports on various neoplasms in different parts of the body are made and the results are published after five years' and more observation following treatment.

The statistical studies published by the American College of Surgeons likewise compare the results of treatment by every method, including surgical, and particular care has been taken that only those cases are included where the records are complete with all necessary laboratory examinations at various "standardized" hospitals in America.

Surely the surgeons and the profession generally should be better acquainted than they are now with some of the very numerous reports which are everywhere available.

Yours, etc.,

H. FLECKER.

71, Collins Street, Melbourne,
May 3, 1927.

MALARIAL THERAPY.

SIR: Malarial therapy now has a definite place in the treatment of certain organic diseases of the nervous system, notably general paralysis of the insane. Failure to make use of this method in suitable cases amounts in my opinion to gross neglect and malpraxis.

In my own practice I have found very great difficulty in obtaining suitable donors for this purpose and, judging from recent advertisements inserted by public hospitals in the lay press, my experience in this respect has not been unique.

I suggest, therefore, that our Association should officially bring this important matter under the notice of the Director of Public Health for his earnest and immediate consideration. Government departments the world over are notoriously lacking in initiative, even though they may be highly efficient in other respects. With regard to this matter, somebody must start the ball rolling and I think that it would best come from the British Medical Association.

There is no reason, so far as I know, why the scheme of the London County Council should not be inaugurated. Briefly the arrangements are as follows: *Anopheles*, infected with a benign tertian strain of malaria, are kept at

a central dépôt, housed in minute cages. When a practitioner wants to inoculate a patient, he telephones to that effect and the mosquitoes in their cages are sent out to the given address in charge of a junior attendant. The cage is then placed on the buttock of the patient, the sliding bottom of the cage is withdrawn and the fortunate animal makes a sumptuous meal. If business is slack, the mosquitoes are kept alive by being fed at suitable intervals on the blood of a mammal, kept at the central dépôt for the purpose. An ordinary laboratory animal serves the purpose.

The advantages of such a scheme are: (i) It is cheap. (ii) it is highly efficient, with 100% of successful inoculations, (iii) it is easily and readily accessible to all members of the profession, be he consultant, general practitioner or a member of the staff of an institution, (iv) it is extraordinarily simple and fool-proof.

I may add that I would rather have had this matter brought under the notice of the profession by somebody senior to myself. I have discussed the matter with several older colleagues, but so far they have remained stonily aphasic. Hence this communication.

Yours, etc.,

ERIC SUSMAN.

215, Macquarie Street, Sydney,
May 6, 1927.

ETHYLENE AND OXYGEN.

SIR: I wish to congratulate Dr. G. Leonard Lillies on his paper "Anæsthesia and the Newer Anæsthetics: Ethylene and Oxygen" which appeared in THE MEDICAL JOURNAL OF AUSTRALIA of April 23.

The cost of ethylene in Australia is the cause of its slow introduction in this country. But anyone who has used it or seen it used, realizes that it is the safest anæsthetic for many cases and the anæsthetic of choice in many others. Dr. Lillies has not used it for intraoral surgery and suggests possible difficulty in keeping the patient anæsthetized. I have used it for some three hundred and fifty dental operations and consider that it is the most satisfactory anæsthetic for dental work that I have yet used. At the Dental Department of the Adelaide Hospital I should use it in all cases, if the instruction of the students had not to be considered.

I use the Heidebrink Apparatus Model R with the addition of an earth wire attached to the stand and a metallic connexion from the nasal inhaler to the machine.

Oxygen is used in all cases, never less than 8% even in the induction in adults. In children 15% of oxygen is given from the beginning. For the maintenance 15% of oxygen is generally possible in all patients and often 20% or 25% may be given. A large gauze plug is put at the back of the mouth when the mouth cover is removed at the end of the induction period; from this point anæsthesia is maintained with the nasal inhaler alone. The addition of ether is required sometimes in vigorous adults of the "returned soldier" type.

I have no experience of ethylene and oxygen for tonsillectomy and foresee considerable difficulty in its application to the dissection and snare method which is most commonly used in Adelaide.

Yours, etc.,

GILBERT BROWN.

Verco Buildings, North Terrace, Adelaide,
May 5, 1927.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

THE undermentioned have been registered, under the provisions of *The Medical Act*, 1912 and 1915, New South Wales, as duly qualified medical practitioners:

Burton, George Lewin, M.B., Ch.M., 1927 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Clark, Donald, M.B., B.S., 1908 (Univ. Glasgow), 26, Toxteth Road, Gleebe Point.
 Cramp, John Francis, M.B., B.S., 1925 (Univ. Adelaide), 7, Grafton Street, Woolahra.
 Jones, Ernest Benjamin, M.B., Ch.M., 1927 (Univ. Sydney), St. Mark's Road, Randwick.
 McGeorge, John Alexander Hughes, M.B., Ch.M., 1927 (Univ. Sydney), The Hospital, North Parramatta.
 Quinn, Thomas Vincent, M.B., B.S., 1923 (Univ. Adelaide), 62, Chloride Street, Broken Hill.
 Retallick, Thomas Grenville Clarence, M.B., B.S., 1926 (Univ. Melbourne), Albury Hospital.

Restorations to Register:

Levy, Albert Lewis, L.R.C.S. (Edinburgh), 1895; L.R.C.P. (Edinburgh), 1895; L.F.P.S. (Glasgow), 1895; 219, Macquarie Street, Sydney.
 Reed, Henry Albert, M.R.C.S. (England), 1885; L.R.C.P. (London), 1885; L.S.A. (London), 1884; 253, Bridge Road, Forest Lodge.

For Additional Registration:

Gearin, John Joseph, F.R.C.S. (Edinburgh), 1926.
 McEncroe, Francis John, Ch.M., 1927 (Univ. Sydney).

Change of Name:

Hardy, Ruth, M.B., Ch.M., 1922 (Univ. Sydney), to Stephens, Ruth.

QUEENSLAND.

THE undermentioned have been registered, under the provisions of *The Medical Act of 1925*, Queensland, as duly qualified medical practitioners:

Battaglia, Giovanni Battista, M.D., 1925 (Univ. Palermo), Brisbane.
 Adamson, Reginald Victor, M.B., B.S., 1925 (Univ. Melbourne), Miles.
 Hewitt, Thomas George, M.B., Ch.M., 1924 (Univ. Sydney), Cairns.
 Thorp, Joseph Herbert, M.B., Ch.M., 1925 (Univ. Sydney), Atherton.
 Westacott, Leslie John, M.B., B.S., 1926 (Univ. Melbourne), Mackay.
 Cook, James Wilson, M.B., B.S., 1926 (Univ. Melbourne), Mackay.
 Chapman, Frederick James, M.B., B.S., 1926 (Univ. Melbourne), Toowoomba.

Restorations to Register:

Kelly, Thomas Joseph Brooke, L.R.C.P. and S. (Ireland), L.M., 1905; F.R.C.S. (Ireland), 1909; Brisbane.
 Higgins, Patrick Charles, L.S.A., L.R.C.P. (London), M.R.C.S. (England), 1908; Coolangatta.
 Patterson, Norman Roy, M.B., 1921 (Univ. Sydney), Adavale.
 Thomas, Edna Lyall, M.B., B.S., 1921 (Univ. Melbourne), Urundangle.

TASMANIA.

THE undermentioned has been registered under the provisions of *The Medical Act, 1918*, Tasmania, as a qualified medical practitioner:

Clemons, Jean Wilmore, M.B., B.S., 1926 (Univ. Melbourne), Launceston.

AN EXPEDITION TO THE GREAT BARRIER REEF.

For the benefit of naturalists and especially ornithologists and zoologists excursions have been organized during recent years to islands where opportunities for the study

of the habits of rare birds and animals can be combined with sport. Last November Mr. E. F. Pollock, of the Royal Ornithologists' Union, conducted a party to Lord Howe Island. This undertaking proved a great success. He is now making arrangements to take a party of nature lovers, ornithologists and naturalists to some of the coral islands of the Great Barrier Reef. He proposes to use a steamer that leaves Sydney on November 13, 1927. The party will be away for about five weeks. It is planned to pitch camp in succession on four islands and from these bases to make one-day trips to adjacent islands. A small steamer will be hired at a port near these islands. As the visit will coincide with the breeding season of sea birds and turtles, the tour should prove very attractive to those interested in nature studies.

We recommend those who can enjoy and profit from an excursion of this kind, to obtain further information from Mr. E. F. Pollock, Te Whare, Carrington Avenue, Strathfield, near Sydney. The trip should be an ideal and inexpensive holiday.

CORRIGENDUM.

IN a report of a meeting of the Queensland Branch of the British Medical Association and the Brisbane Hospital Clinical Society in the issue of April 30, 1927, reference was made to a splint for fractures of the lower extremity. The splint was made by Mr. Robertson, of Savage and Company, Brisbane, not of Melbourne.

Books Received.

TROPICAL SURGERY AND SURGICAL PATHOLOGY, by Karuna K. Chatterji, F.R.C.S.I., with a Foreword by Major-General Sir R. Havelock Charles, G.C.V.O., K.C.S.I., M.D., LL.D., M.Ch., F.R.C.S.I., I.M.S. (Ret.); 1927. London: John Bale, Sons and Danielsson, Limited. Royal 8vo., pp. 274, with illustrations. Price: 16s. net.
 HEALTH RECORD FOR CHILDREN, by J. Theron Hunter, M.D.; 1927. Baltimore: The Williams and Wilkins Company. Demy 8vo., pp. 52.
 OUTLINES OF COMMON SKIN DISEASES INCLUDING ERUPTIVE FEVERS, by T. Caspar Glichrist, M.D.; 1927. Baltimore: The Williams and Wilkins Company. Post-8vo., pp. 54, with illustrations. Price: 1.50 net.
 URINARY SURGERY: A HANDBOOK FOR THE GENERAL PRACTITIONER, by William Knox Irwin, M.D., F.R.C.S.E.; Second Edition, Revised and Enlarged; 1927. London: Baillière, Tindall and Cox. Crown 8vo., pp. 279. Price: 10s. 6d. net.
 BACTERIOLOGICAL ATLAS: A SERIES OF COLOURED PLATES ILLUSTRATING THE MORPHOLOGICAL CHARACTERS OF PATHOGENIC MICRO-ORGANISMS, by Richard Muir; 1927. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 134.
 ULTRA-VIOLET RADIATION AND ACTINOTHERAPY, by Eleanor H. Russell, M.D., B.S. (Dunelm), and W. Kerr Russell, M.D., B.S. (Dunelm); 1927. Edinburgh: E. and S. Livingstone. Royal 8vo., pp. 460, with illustrations.
 THE PLATYPUS: ITS DISCOVERY, ZOOLOGICAL POSITION, FORM AND CHARACTERISTICS, HABITS, LIFE HISTORY, ETC., by Harry Burrell, C.M.Z.S.; 1927. Australia: Angus and Robertson, Limited. Royal 8vo., pp. 227, with illustrations. Price: 25s. net.
 THE CATHOLIC NURSE: HER SPIRIT AND HER DUTIES, by Richard J. Murphy, S.J.; 1927. Australia: Cornstalk Publishing Company; Sydney: Angus and Robertson, Limited. Crown 8vo., pp. 179. Price: 4s. 6d. net.
 THE HEART AND ITS DISEASES: A HANDBOOK FOR STUDENTS AND PRACTITIONERS, by Charles W. Chapman, M.D. (Durham), M.R.C.P. (London); 1927. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 216, with illustrations. Price: 8s. 6d. net.
 PRACTICAL METHODS IN THE DIAGNOSIS AND TREATMENT OF VENEREAL DISEASES FOR MEDICAL PRACTITIONERS AND STUDENTS, by David Lees, D.S.O., M.A., M.B., F.R.C.S.; with introduction by William Robertson, M.D., F.R.C.P., D.P.H.; 1927. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 621, with illustrations. Price: 15s. net.
 MUSCULAR CONTRACTION AND THE REFLEX CONTROL OF MOVEMENT, by J. F. Fulton, B.Sc. (Harvard), M.A., Ph.D. (Oxon.); 1926. Baltimore: The Williams and Wilkins Company. Royal 8vo., pp. 659, with illustrations. Price: \$10.00 net.

Diary for the Month.

JUNE 1.—Victorian Branch, B.M.A.: Branch.
 JUNE 1.—Western Australian Branch, B.M.A.: Council.
 JUNE 3.—Queensland Branch, B.M.A.: Branch.
 JUNE 7.—Tasmanian Branch, B.M.A.: Council.
 JUNE 9.—South Australian Branch, B.M.A.: Council.
 JUNE 9.—Victorian Branch, B.M.A.: Council.
 JUNE 10.—Queensland Branch, B.M.A.: Council.
 JUNE 14.—Tasmanian Branch, B.M.A.: Branch.
 JUNE 14.—New South Wales Branch, B.M.A.: Ethics Committee.
 JUNE 15.—Western Australian Branch, B.M.A.: Branch.
 JUNE 16.—New South Wales Branch, B.M.A.: Clinical Meeting.
 JUNE 20.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 JUNE 21.—Tasmanian Branch, B.M.A.: Council.
 JUNE 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 JUNE 22.—Victorian Branch, B.M.A.: Council.
 JUNE 24.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. Jack Rupert Law Willis (B.M.A.) has been appointed an Honorary Medical Officer to the Mount Gambier Hospital, South Australia.

Dr. George Sutton and Dr. Frank Payne Edwards (B.M.A.) have been appointed Certifying Medical Practitioners at Melbourne, under the provisions of the *Workers' Compensation Acts, Victoria*.

Dr. John Gowan Barnaby (B.M.A.) has been appointed Public Vaccinator at Learmonth, Victoria.

Dr. Basil Frederick Roberts Stafford (B.M.A.) has been admitted to the Public Service, Queensland, and appointed Assistant Medical Superintendent, Hospital for the Insane, Toowoomba, Queensland, on probation for a period of six months.

Dr. Robert Kellas has been appointed Government Medical Officer at Lismore, New South Wales.

Dr. Reginald Abraham Sicree (B.M.A.) has been appointed Public Vaccinator at North Fitzroy, Victoria.

Dr. John Coffey (B.M.A.) has been appointed Deputy Commissioner of Public Health, Brisbane, Queensland.

The announcement that Dr. J. E. F. McDonald (B.M.A.) had been appointed Assistant Medical Superintendent to the Hospital for the Insane, Toowoomba, was made in error. Dr. McDonald has held this position for a number of years. He is now acting as Medical Superintendent to the Hospital for the Insane, Ipswich, Queensland, on probation for a period of six months.

In the issue of May 14, it was announced that Dr. Wilfrid Arthur Brady (B.M.A.) had been appointed Second Assistant Medical Superintendent, at the Hospital for the Insane, Goodna, Queensland. Through inadvertence we omitted to state that the appointment was on probation for a period of six months.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

BALMAIN AND DISTRICT HOSPITAL: Honorary Radiologist.
 DEPARTMENT OF REPATRIATION: Medical Officer.
 GOVERNMENT OF WESTERN AUSTRALIA: District Medical Officers (Two).

ROYAL ALEXANDRA HOSPITAL FOR CHILDREN, CAMPERDOWN, SYDNEY: Honorary Ear, Nose and Throat Surgeon.

THE UNIVERSITY OF MELBOURNE: Demonstrator in Clinical Physiology.

WATERFALL SANATORIUM, NEW SOUTH WALES: Senior Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Hon- orary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUS- TRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVI- SION): Honorary Secretary, Wellin- gton.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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